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TEXTILE WORLD RECORD

1910

Special Features.

The Annual Report of New Mill Construction for 1910.

The Meeting of the American Woolen and Worsted Manufacturers' Association.

The Paterson Silk and Industrial Exposition.

Estimating the Cost of Underwear.

The Printing of Skein Yarn.

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Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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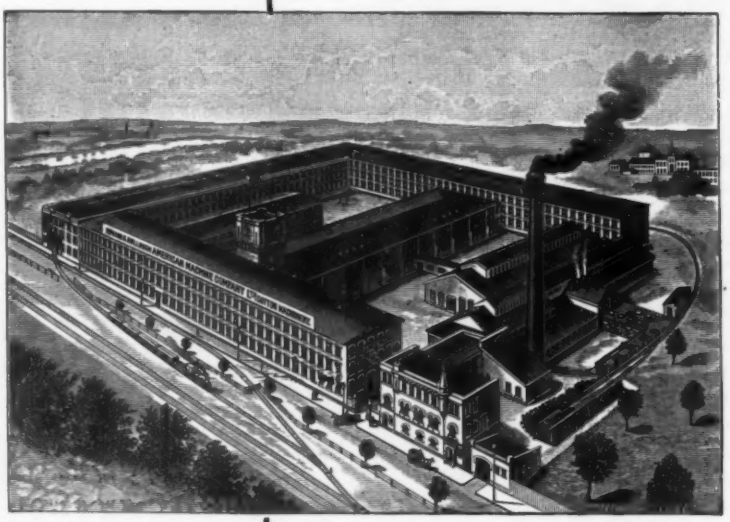

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VOL. 40 (NEW SERIES.) December, 1910 No. 3

Monthly Comment.

How Shoddy is Made.

The manner in which the popular ignorance regarding wool materials is fostered by those who ought to know better was well illustrated last month by the following editorial in the Springfield Republican:

The Seventeenth New York Congressional District is located at the northern extremity of New York city and has been represented for three terms by William S. Bennett, a Republican, who received a plurality of about 8,000 two years ago. He is running for reelection on his record of support of the Payne-Aldrich tariff and Speaker Cannon. Henry George, Jr., as the Tammany and Independence League nominee, is making a strong fight with a good chance of being elected. He has the indorsement of so conservative a paper as the New York Evening Post. It is described as a picturesque campaign with cart tail oratory as its principal feature. Not a little help seems to be coming to Mr. George on account of the great admiration for his eminent father held by many quiet, thoughtful people. This incident is given by the Post:

An old man, who, according to Mr. George, looked like a hostile Republican, approached the platform one evening and said:

"Do you adhere to the principles of your father?"

"I certainly do," replied George.

"Do you believe in free trade?"

"I do."

"Do you believe in single tax?"

"With my last breath."

The old man started to leave the hall, but Mr. George stopped him with this remark:

"I have answered your questions. Now I want to make one request in return. Will you tell these people why you asked those questions?"

"Yes," replied the old man, "I was a great admirer of your father and his doctrines. If you adhere to what he believed, you are good enough for me."

But while Mr. George is a free trader and does not hesitate to talk free trade to his audiences, as a practical matter he stands simply for tariff reduction, being satisfied for the present if a few layers can be taken off from the top of the high tariff wall. One of his campaign devices is to take along a lot of samples of so-called woolen cloth manufactured under the high tariff on wool, and after scattering the samples among the crowd describe the character of the fabric. It is shoddy and:

"How is shoddy made? It is made by taking old woolen clothes, bundles of rags, gathered from ash cans and everywhere, putting them into a grinder, and reducing them to dust. Then the manufacturer makes a paste of the dust, and he takes cotton and blows the paste into it until the cotton looks like wool. And as you wear your shoddy suit, the wool wears off, leaving the cotton; and the first rain shrinks it up."

There is more truth than exaggeration in this description. It tells us something of how "woolen" clothing under high taxed wool is brought within reach of the poorer people.

That editorial exhibited a prejudice so intense against the use of reclaimed wool, and a lack of knowledge so complete regarding wool goods that we sent to the Republican the following letter which was published on the day Henry George, Jr., was elected to Congress:

Sir: It is with astonishment and regret that I find you quoting with approval the following extract from a stump speech by Henry George, Jr.:

"How is shoddy made? It is made by taking old woolen clothes, bundles of rags, gathered from ash cans and everywhere, putting them into a grinder and reducing them to a dust. Then the manufacturer makes a paste of the dust, and he takes cotton and blows the paste into it until the cotton looks like wool. And as you wear your

shoddy suit, the wool wears off, leaving the cotton; and the first rain shrinks it up."

Shoddy is not made by reducing rags to dust. The manufacturer does not make a paste of wool dust and blow it into cotton. The shoddy in cloth does not wear off leaving the cotton to be shrunk by the rain. Wool and shoddy are more likely to shrink by being wet than is cotton. The fact is the extract quoted by you from Mr. George's speech is about what we expect and would laugh at in a school composition by a child of 10 years.

Shoddy is reclaimed wool, and if wool were not reclaimed and used over again and again and still again, and then some more, human life in temperate and cold climates would be impossible on anything like the present scale. This will be made evident to you by the fact that if all the wool grown in the world were manufactured into pure wool cloth, it would yield annually about 13 ounces of cloth, or a piece 35 inches square of a medium weight fabric for each person living outside of the tropics. If that fact were impressed on the minds of the American people Henry George, Jr., would be hooted when he gave his explanation of how shoddy is made, and there would be a rush to erect a monument to the discoverer of the actual process.

This process of reclaiming old wool consists in tearing old cloth and yarn apart so as to reduce it to a fibrous mass suitable for reworking into cloth. If the old cloth or yarn is soft twisted and made of long wool, the reclaimed wool is longer and in every way better for making cloth than much of the wool that comes directly from the sheep's skin, such, for example, as shearlings stripped from sheep skins, wool of four months' growth, etc.

Most of the misunderstanding about wool shoddy arises from the colloquial use of the word "shoddy" as meaning not genuine, sham, pretentious. The French and the Germans escape this confusion by giving reclaimed wool names in accordance with the truth. The former call it "laine renaissance," regenerated wool; the latter, "Kunstwolle," artificial wool.

Schedule K, the wool and wool goods tariff, needs revision, but that necessary work is thwarted by the absurdly ignorant statements such as you quote from Henry George, Jr., for such statements give the opponents of honest revision a longed for opportunity to ridicule and discredit the work of real reform. Before Mr. George discusses further the wool and wool goods tariff and schedule K, he should spend a few weeks or months in woolen and worsted mills studying the facts in order that he may be able to instruct others. He may, as he asserts, "adhere to the principles of his father, believe in free trade and in a single tax with his last breath," but he certainly has departed far from the practice of his father, which was to determine the truth before he attempted to expound it.

In conclusion I want to suggest that no journal is better situated for putting Mr. George on the right track as regards the manufacture of wool goods than your own, owing to your convenient access to mills in which that industry is carried on.

Mr. George's stump speech and his subsequent election to Congress serve as a reminder that the 62d Congress will present an excellent opportunity for a campaign of education among the many statesmen who will make their first appearance as national legislators at Washington in December, 1911.

German Weights and Measures.

A recent issue of the "Abendzeitung," of Augsburg, Germany, gave a review of the German cotton trade by H. Semlinger, of Bamberg, which closed with the following reference to the editorial, "The Continental Chaos," which appeared in our October issue:

An episode in this connection sheds a strong light on the confusion of weights and measures which prevails in cotton spinning and weaving mills in spite of our metric training. My review of the cotton trade for the first six months of 1910 was republished in several English and American trade journals. The expression "19/18 faedige Kattune aus 20/20er" was not clear to the Americans and the editor of the Textile World Record of Boston wrote me in regard to it, asking whether the number of threads was based on the centimeter or English measure and whether the yarn number was English or metric. An explanation would be welcomed by him as the width was given in centimeters. I gave him the desired explanation, but with a certain feeling of shame. In an article entitled "The Continental Chaos," the American editor expresses his astonishment that, in spite of the fact that the metric system of weights and measures is legally compulsory in Germany, the people of that country should continue to use all other weights and measures without considering it necessary to distinguish these departures from the legal standards. The man is exactly right. It is a chaos that we are involved in, because of our use of the English inch and the English weights in spinning and reeling, the French inch in weaving, and the metric, English and Saxon systems of yarn counts without taking the trouble to indicate the standards by distinguishing marks. The rather caustic comment on this confusion by the Textile World Record has again made it clear to me how firmly established these antiquated customs are, to which our cotton industry clings with stubborn prejudice in spite of the agitation that has been carried on for a natural and technically possible reform. The fact that at my suggestion the width of cotton goods is now given at Stuttgart in centimeters instead of inches is a step in the right direction.

Since the above was written, we have received the following letter:

Bamberg, Germany, Nov. 2, 1910.

Dear Sir: I thank you for sending me a copy of the Textile World Record for October, which

contains an article entitled "The Continental Chaos" and in which you discuss my letter of Sept. 10th in regard to the chaos of textile weights and measures in Germany. I am compelled to agree with you in this respect, although as a patriot I very much regret the necessity for doing so. A chaos of textile weights and measures does exist in our country and I have publicly admitted this fact in my latest report on the situation in the German cotton industry, a copy of which you will find enclosed. Perhaps we shall some day succeed in throwing out all foreign weights and measures from the German industry and when that time comes you will have the pleasant self-consciousness of having contributed to the result.

Yours faithfully,

H. Semlinger.

We shall be gratified if our directing attention to the Continental chaos with the object of preventing a like chaos of weights and measures in English speaking countries, goads the Germans to a successful effort to unify their standards, but we doubt very much if that will be the result. The experience of many countries has invariably proved that the inertia of established customs is stronger than the popular will, and as a result the inhabitants of a country continue from generation to generation using weights and measures they are eager to discard. If Germany succeeds now, as Herr Semlinger hopes, it will be the first case of its kind in the history of the world.

Cotton Tare.

A law prohibiting an allowance of less than 6 per cent. for tare on cotton bales was enacted in South Carolina last January. Following is a copy of the act, whose object evidently is to make the allowance of 6 per cent. a custom for cotton sold to Americans as well as to foreign buyers:

Section 1. Be it Enacted by the General Assembly of the State of South Carolina, that from and after the approval of this Act, it shall be unlawful for any person, firm or corporation engaged in the business of buying cotton in this State as principal or agent, to deduct any sum for bagging and ties from the weight or price of any bale of cotton, when the weight of the bagging and ties does not exceed 6 per cent. of the gross weight of such bale of cotton. In the event that the weight of the bagging and ties exceed 6 per cent. of the gross weight of such bale of cotton, only the excess over the said 6 per cent. may be deducted.

Sect. 2. For each and every violation of this Act, the offender shall be guilty of a misdemeanor and shall be fined in the sum of not less than five dollars, nor more than twenty-five dollars, or imprisoned not less than ten days, nor more than thirty days: Provided, this Act shall not apply to what is known in the trade as round bales, and bales of cotton which weigh less than three hundred pounds.

Artificial Silk Combine.

The French journal, "l'Industrie Textile," states that it has information from a trustworthy source that a number of French companies manufacturing artificial silk have entered into an agreement for the regulation of prices for their products. The combine includes the following firms: *La Soie artificielle de Livet*, *La Soie artificielle d'Izieux*, the *Societe francaise de la viscose*, and the *Societe ardechoise*. These firms manufacture artificial silk by the cuprammonium and viscose processes, as distinguished from the Chardonnet silk, which is made in several French mills, that are not parties to the price agreement. It is stated that the combine was made necessary by the decline in the price of artificial silk. While an advance is expected none has yet been announced.

Bribery of Employes.

The bribery of mill employes by firms selling goods to the mill owners has become so great an evil in Germany that a movement has been started to form an organization to combat the practice. A meeting called for this purpose at Mainz on October 31 was attended by representatives of the iron and steel, chemical, automobile and textile industries, and of the retail trade and several Chambers of Commerce. Spirited addresses were made by a number of representative manufacturers, who agreed that united action to suppress the evil had become a necessity. A committee composed of the representatives of ten large corporations was appointed to take the preliminary steps toward forming the organization and a meeting in Berlin was called for this purpose. A very serious effect of the bribery evil is the general demoralization of the employes. It is not uncommon to find men who look

upon the practice of taking bribe money as perfectly justifiable, and who do not hesitate to admit that they accept "commissions" from firms selling material to their employers.

Bounties on Wool and Woolens in Newfoundland.

Newfoundland recently enacted a law providing bounties for the encouragement of wool growing and wool manufacturing in the Colony. It also provides that machinery for the manufacture of wool goods shall be admitted into Newfoundland free of duty. Following is the text of the law:

1. There shall be granted a premium upon all raw wool imported into this Colony and its dependencies for the purpose of manufacturing wearing apparel, blankets, rugs, carpets or other like manufactures to be computed at the rate of five per cent. upon the original cost of such wool, at the place where the same shall be shipped for importation.

2. There shall be granted a premium upon all wool raised in this Colony and manufactured into wearing apparel, blankets, rugs, carpets or other like manufactures, in factories or buildings where more than ten persons are annually employed, to be computed at the rate of five per cent, upon the value of such wool. The value of such wool upon which the said bounty shall be paid shall be fixed from time to time by the Governor-in-Council.

3. All machinery imported into this Colony, except such as can be manufactured in this Colony, for the manufacture of the aforesaid woolen goods, shall be exempted from the payment of duty.

4. The premium hereby granted shall be paid to the manufacturer upon the production of a satisfactory affidavit setting forth that the wool so imported has been used in the aforesaid manufactures.

5. It shall be lawful for the Governor-in-Council to enter into an agreement, on behalf of the Colony, for any number of years, not exceeding ten, with any person or corporation prepared to engage in the manufacture of woolens in this country and to guarantee, on behalf of the Colony, that the premium referred to herein shall continue in force for a period of ten years, and that, during said period, the present duty payable on all woolens imported into this country shall not be reduced.

6. This Act shall come into force upon the first day of July, Anno Domini one thousand nine hundred and ten, and shall continue and be in force thereafter for the period of ten years.

The International Cotton Federation.

The international committee of this Federation, consisting of representatives from most of the leading cotton manufacturing countries of the world, held a meeting in London last month, at which the situation in the world's cotton trade was discussed. The committee was received by the President of the Board of Trade, who stated that the Government was heartily in sympathy with the efforts to extend the cultivation of cotton and put an end to the evil of gambling in that staple. The members of the committee were entertained at luncheon by members of the Government. In proposing "The International Cotton Federation" Sir Edward Grey in beginning his remarks took the precaution to assure his hearers that while he took the cotton trade very seriously he did not take it to be the main object of human existence on this planet. He said:

The cotton industry was great in size, great in importance, and great from whatever point of view one looked at it. The worth of an industry could be measured by the value of its product. The making and the demand for cotton goods were sometimes said to be one of the first signs of civilization. It would be going too far to say that cotton was the ultimate end of civilization (laughter), but this at least could be said, that no people had yet reached such a stage of civilization as to have outgrown the use of the products of the cotton industry. (Applause.)

Sir Edward then referred to cotton growing in Egypt and the Soudan:

As regarded Egypt and the Soudan, to which the British Government stood in a special connection, the Agricultural Department was being organized in Egypt at the present moment with a view to overcoming the dangers to which the Egyptian cotton crop was subjected, and in the Soudan the Government were making experiments, not as to whether the growth of cotton was possible there, because that was known, but as to what was the greatest scale on which the growth of cotton could be encouraged. (Cheers.) In doing that the Government had to be careful not to interfere with the growth of cotton in Egypt, because it was no good encouraging the growth of cotton in one place if thereby they prejudiced it in another. They were not looking at the growth of cotton merely from the national point of view. They were anxious to encourage its growth because they knew that the crops would not only benefit England but the whole industry, and because they hoped there would be reciprocity by other nations on similar lines.

In responding, C. W. Macara, the president of the Federation, said:

Cotton was not indigenous to America, and it took ten years for the Americans to produce an annual crop of 100,000 bales, a fact which might be usefully remembered by the British Cotton Growing Association and by the Continental Cotton Growing Association, which had followed the lead of England in developing cotton cultivation in their respective colonies and was making splendid progress. Just now one heard much about the relative positions of the English cotton trade today and 35 years ago. He would like to point out that 35 years ago the cotton crop of the world was about seven million bales. Now it averaged twenty million bales. It was impossible for a nation of 44 millions to cope with that tremendous increase of raw material and demand for cotton goods from the rapidly increasing population of the world. England had no divine right to the cotton trade, any more than America had any divine right to be the sole grower of cotton.

The length of time taken by the Americans to produce a cotton crop of 100,000 bales has nothing to do with the problem of increasing the supply at the present time. Such reasoning by analogy as that of Mr. Macara would, if followed, lead to the most grotesque and absurd attempts to grow cotton where climate and soil are unfavorable. The efforts to increase the world's cotton supply should be directed along the lines of least resistance. No amount of fallacious reasoning by analogy, no concourse of government officials, no matter how high, no expenditure of treasure, no matter how vast, no human effort will avail to overcome natural laws in the growing of cotton.

Later in the day the committee was received by the Earl of Crewe, Secretary for India. Mr. Macara addressed the Secretary as follows:

In recent years the cotton crop of the world had been inadequate for the requirements of the industry, and they had an impression that it was from India they would get the speediest relief. They believed that with the assistance of the Government a great development might take place both in the quality and quantity of the cotton produced in that vast Empire. There was a great call from other European countries for Indian cotton, and the more it was used by them the larger was the amount of American cotton available for England.

Herr C. O. Laugen, of M.-Gladbach, Germany, then said:

The question of the improvement and extension of cotton growing in India was of the highest importance. Germany was, after India and Japan, the greatest consumer of Indian cotton, its mills using annually about 400,000 bales, so that the more Indian cotton the world was enabled to take the less American cotton would be needed, and this would be an undoubted advantage in a time of scarcity like the present. A little improvement in the quality of Indian cotton would mean a great advantage to all European spinning, resulting of course at the same time in more remunerative returns to the cotton planters in India.

Herr Arthur Kuffler, of Austria, pointed out that one-third of the consumption per Austrian spindle was of East Indian cotton, and furthermore there was no speculation in futures. The Earl of Crewe, in his reply, took the same position as that taken by his predecessor, Lord Morley, when a deputation from the cotton trade waited on him on a similar errand a few months ago. The Earl of Crewe, after reminding the delegation that Lord Morley had promised to submit their suggestions to the Government of India, said:

We have not yet received the full views of the Government on India on the subject, but when they did arrive they would receive the most careful consideration of the India Office. He would be gled if they found it possible in any way to meet the spinners in regard to this question of cotton growing in India. As to improving the quality, he understood that some of the experiments which had been made with foreign seed had not been altogether successful, and that therefore they must look rather to careful crossing with indigenous varieties. As to quantity, he need not repeat what was said by Lord Morley. It would not of course do for cotton growing to compete in India with the production of foodstuffs, but he was glad and willing to believe that there was room for both.

The values of raw silk invoiced from Canton, China, to the United States during 1909 totaled $3,037,993, against $4,427,390 in 1908; of waste silk, $246,406, against $116,722; and of silk goods, $20,430, against $21,807.

The total quantity of waste silk consumed per year must amount to some 45,000,000 pounds, and the value of the world's production of yarns, at, say, $1.58 per pound, would be nearly $24,000,000.

There is about $70,000,000 invested in the linen industry in Ireland. There are 935,000 spindles and 36,000 power looms; 70,382 people are employed, whose annual wages amount to $16,500,000.

Experiences of a Wool Buyer in the Far West.

(By Our Special Correspondent.)

(Continued from November.)

One of the strange types of people in New Mexico are the Penitents, a religious sect of Mexicans who are said to be neither of the Catholic nor Protestant churches. Their peculiar belief is that their sins can be atoned for by doing penance. Around Easter is the time for doing penance. Processions are formed and the really penitent, stripped to the waist, march and sing and at each step lash themselves on the back with ropes made of Mexican soap weed, which when braided are like ropes of spikes, every blow drawing the blood. Others do penance by carrying heavy wooden crosses from one parish to another. At one time the frenzy was so great that some would volunteer for crucifixion. This is now prohibited, but there have been cases when the hands and feet have been lashed to the cross. On one occasion the penitent's friends got drunk and left the victim to his fate. He died from the results of his enthusiasm. It is not a healthy proceeding to be caught watching their processions as they do not hesitate to shoot at offenders of this kind. One man got by stealth some photographs of one procession. These he kindly loaned to a magazine writer who published them. When the people found this out the photographer was obliged to stay away from open doors and windows for some months. He was shot at several times.

Many difficulties present themselves to a man breaking into the New Mexican wool buying business. The local merchants usually have accounts against the sheep man for supplies and this gives him a cinch on the wool if he wishes to buy it. The merchant's profits on supplies are large enough to admit of his taking the wools at the price offered by any outsider, and if it comes to a pinch the merchant can pay more if he wants the wool. In any event the local merchant is strong enough to control the situation if he so desires. Aside from the local stores one or two Boston houses have had a strong hold on this business for years and in many places they operate through the local merchants, which is a tremendous advantage when they really want the wools. Sometimes the wools are bought outright from the storekeepers, and at other times taken on joint account. The storekeeper gets the poor Mexican both ways. He makes a large profit on the goods sold, buys not only the

A FLOCK OF NEW MEXICAN MERINO SHEEP.

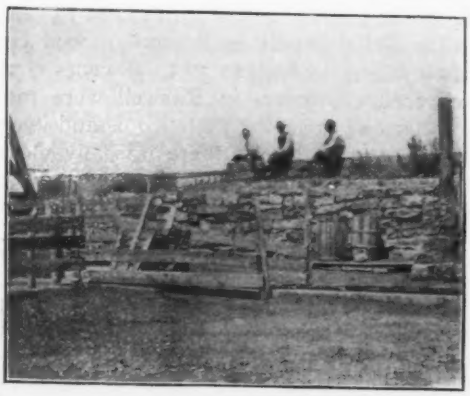
wool, but also the lambs and mutton at practically his own price, generally keeping the Mexican in debt so he is easy to handle. This year many of the sheep men were a season behind in their payments and storekeepers worried somewhat about squaring accounts with low priced wool and mutton.

The buying system is what might be called one price work. One price for everything and the heavy wools taken low enough to make light wools dirt cheap. It is no easy matter to break into the game as it takes a long time to arrange with a line of merchants who are willing to operate on a reasonable basis. They all seem to want something off the top as well as the bottom and middle.

The American sheep man of New Mexico is up to date, hard headed and produces the best wools. They take good care of their sheep, do not inbreed, and therefore have a

desirable product. Their business is done through the banks, who charge 10 per cent. for loans and overdrafts. If the sheep men do not get 75 to 80 per cent. increase from their breeding ewes they complain of a poor season, and if 35 to 40 per cent. only is secured they talk of ruin.

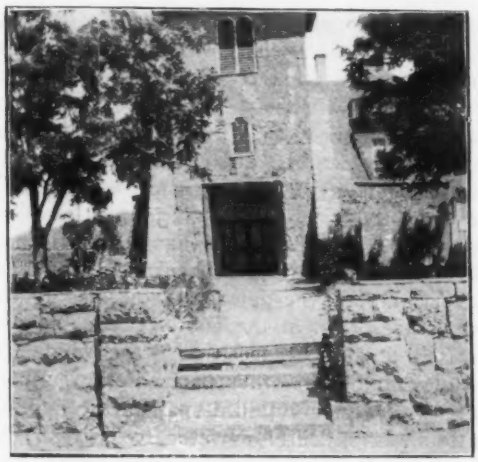
The cost of running sheep in this country



A DIPPING VAT ON A WESTERN RANCH.

varies with the individual. Some will agree that it costs 35 to 40 cents a head to run wethers and others up to $1.25 a head for running ewes. One of the largest sheep men in the territory who runs mixed bands of wethers and ewes claims it costs $1.10 per head. To run an outfit of wethers the cost is said by good authority to be 80 cents a head. The average loss on the original herds is figured to average 10 per cent. over a term of years. Some say if they could be assured of 12-cent wool over a period of years they could make money, while others cannot see anything in the business unless they have 14-cent wool. It all depends on the investment. Some who have to drive wells for water for the sheep, no doubt have a higher operating cost than the man who can get free water, range and feed. It is not hard, however, to figure that with the fleeces averaging eight to nine pounds for 12-cent wool they would have to eat some into their lamb crop for expenses. Some of the fleeces, however, will weigh 10 to 13 pounds and for these 12-cent wool will show a profit. With the wool paying expenses, it is not difficult to figure profits on an outfit that has a 75 to 80 per cent. lambing, with lambs at $3 to $4 per head. Sometimes there is but a 40 per cent. lamb crop.

One local store advertises, "We do not sell except for cash; if you have no money we will loan you some." This is one way to get the "collar" on a Mexican. Before the customer gets the money, he gives a mortgage on everything he possesses or hopes to possess, at the rate of 10 per cent. per annum. He is given a check book with the amount of loan to his credit. This is good only at the store, consequently the wool, lambs and mutton are handled through the



THE OLDEST CATHOLIC CHURCH IN THE UNITED STATES. BUILT IN 1857 AT SANTA FE.

store and the proprietor takes the profits at every turn.

Santa Fe is one of the most interesting of cities. Its population is largely Mexican and there are comparatively few modern dwellings. Most of the house are of adobe. Here is located the oldest Catholic church in the United States. Founded by the Spanish priests in 1550, and built of adobe, the heavy timbers of the frame must have been hauled for many hundred miles across the desert on the backs of burros. These timbers are roughly hewn and carved by those hardy pioneers. Near the church is the adobe hut said to have been built in 1500 by one of the Indian chiefs. The territorial legislature

convenes at Santa Fe and all its deliberations are conducted in two languages, English and Spanish. It is quite interesting to hear a member making a speech which is rapidly translated into one language or the other by the interpreter, who stands beside the man speaking. All the papers are also printed in the two languages. It may be interesting to know that 65 per cent. of the population of New Mexico is Mexican and half breed.

There are many points of interest in this, one of the oldest cities on this continent. Among some of the interesting places are the cliff dwellings, turquoise mines and an ancient Indian dwelling recently discovered containing 1,200 rooms. The old palace of the Spanish governors is now occupied by the Historical Society, where many ancient relics of New Mexican history may be seen.

In some districts may be seen many attempts at dry farming. The idea is to raise a crop in a country that has very little rainfall by conserving the moisture when it falls during the two months of a partially wet season. After planting, the top soil is pulverized by harrowing. This is repeated after every rainfall, the powdered soil keeping the moisture down at the roots. Crops can be raised in some places when the rainfall is sufficient, but in other parts of the country many have given up in despair or are making attempts to drill for water to irrigate the land. Many of the people were brought into the country through misrepresentation and after either filing on government land or buying worthless tracts of land from land agents, have been starved out. One marvels at the courage of a people who will drive twenty or thirty miles with a couple of barrels to get drinking water and can get a bath only when it rains.

The buying season opened late in New Mexico. Prices having been so attractive during previous seasons the sheep men generally started to hold out for high prices. As a consequence the wool piled up at the different points were held at least sixty days before any attempt was made to meet the market. Some early sales were made at 12 1/2 cents, but this price was not attractive, as the growers generally were asking 18 to 20 cents. There being no one to take interest at the higher figures, the asking prices were gradually reduced until there was some movement at 14 1/2 to 15 cents. Many of the sheep men shipped their clips into Albuquerque to be scoured and sold them later on a basis of 54 to 56 cents delivered East. The commission men were busy and some of the larger clips went on consignment with advances of 10 1/4 to 13 cents.

The better wools in Roswell moved late, some selling as high as 57 to 58 cents clean, delivered. Growers in Roswell were most stubborn as to selling their wools and it was late in August before there was any movement of consequence. A large part of the New Mexican clip was scoured locally, the wools generally being in poor condition. Late in September a large proportion of the clip remained in the country.

ADOBE HOUSE, 400 YEARS OLD, FORMERLY INHABITED BY AN INDIAN CHIEF.

Towns in this country sometimes spring up in short order. One real estate man said he sold $2,000 worth of land at one place before there was a stick of wood on it and shortly there was a thriving city of three or four thousand people. This was a railroad town. Another man told of trying to start a town, but made the fatal mistake of erecting for its first building a church instead of a saloon, and there was never anything further built. Quite often the general merchan-

dise store of a new town is on wheels, and moves on after supplying the people and getting them sufficiently interested in a stationary store.

Roswell, one of the largest cities of New Mexico, is about twenty years old and has a population of 9,000. It is noted for its apples, alfalfa, stock raising and large wool raising interests. It is also noted for its artesian wells, which make irrigation perfect and cultivation possible. The artesian belt in Roswell extends over an area of fifty

A TAME ANTELOPE.

miles, but woe to the landseekers who are trapped into buying outside that magic line, for there land is practically worthless except for grazing purposes, while inside it has been known to increase in value from $1.25 to $600 an acre. Four and sometimes six crops of alfalfa are raised, which sells at from ten to twenty-two dollars a ton and always has an assured market. The climate is exceptionally dry. No rain for months at a time except local showers, which consist of sand storms, so that every window has to be closed and one cannot see across the street. After it is all over the air is as fresh and cool as though it had rained. At this place there is about two and one-half million pounds of wool marketed each year.

After crossing the desert on our way to Colorado the scenery changes. As we climbed towards Trinidad we passed Mt. Capitalene, which has an elevation of 8,000 feet and is the crater of an extinct volcano, as the great blocks of black lava plainly show. We particularly enjoyed the wild flowers, with which the mountain sides were covered, and which consisted of wild poppies, purple and pink sweet peas, tall mariposa lilies, primroses and bright red cacti, which made a moving picture of rarest beauty.

We reached Colorado Springs at noon and took an electric car ride to Manitou, where we drank the three natural spring waters, soda, sulphur and iron, all within a short distance of each other. It was hard to decide which we disliked the most, but to judge from the crowds around them all anxiously awaiting their turn, we concluded it may be a taste that can be cultivated.

The next morning we started with two former cow punchers from Texas to climb the North Cheyenne trail to Mt. Cutler. One of the cow boys had become a minister, the other a doctor of good standing. They had not forgotten their cow boy yells and they used these to good advantage on the burros whenever they became absent minded and stopped.

The trail was a steep one and at the top, which was 8,000 feet above the sea level, we rested and just looked and looked. The vast array of cliffs covered with patches of green, with here and there great rifts through which we could see others miles beyond, seemed wonderful to us. To our right we could see the railway, winding in and out, now spanning the canyons and again tunneling under, on its way to Cripple Creek for its freight of gold. As we turned down the other side, it seemed more perilous than the ascent had been. Now it is a fact that burros are wise little beasts, for they are trained to go just on the edge of a trail, so if there is a slip, they will throw the rider in, whereas if they are in the middle they might throw him outward, to his certain death. This is good mountain philosophy, but it is hard for an inexperienced rider to appreciate it. However, we descended in safety, and as we neared the road, that led to home and dinner, our chargers needed no urging but were possessed to gallop. This may sound pleas-

ant, but it really is a tragedy when it happens to be your first attempt at that sort of locomotion, and when tugging on the reins has no effect whatever. My burro's name was "Sweetheart," but I felt like calling him anything but that the last half mile of the journey, and was glad when the time came to dismount and I could walk to the cars.

One of the great trips from Denver is the one to Mt. McClellan, which is about seventy miles through the mountains and takes all of

THE INGRAHAM RANCH.

one day. The wildflowers are most beautiful through this section and the farm lands are very fertile. Golden, which was the capital of Colorado in '61 and '62, is the first stop and from there we plunge immediately into the mountains, and are completely surrounded by peaks of sheer rock towering above us, out of which protrude the Lion's Head, Lover's Leap and Inspiration Point, the highest in the canyon. Down pour the roaring, rushing mountain streams beside which the train goes for miles, separated only by a hair's breadth it seems, and which we cross and recross as we climb upwards.

We pass hundreds of mines, gold, silver, copper and iron, whose entrances look like little tunnels all along the sides of the giant cliffs. We finally come to the wonderful Georgetown Loop, the world's great achievement in railway engineering, being the highest point for general traffic, and which it took four years to complete. In making this loop we have to cross a bridge which is apparently suspended in mid-air with rushing torrents of water beneath. The next stop is Silver Plume, a small town of 1,000 people and from here we can see six tracks, one above the other, all of which we will traverse on our trip to the clouds. Here also is the point from which the Sunset Route in buckets starts for Mt. McClelland. These are suspended on wires fully 100 feet above the ground, and are pumped up the canyon by an engine at the foot. They tell us that it is safer than the train, but there was not enough money in Colorado to induce me to try it, for I never saw anything that looked so dangerous.

The ascent from here is made on a zigzag track called the Gray's Peak Line, and is laid in a series of switch backs, the train literally climbing a flight of stairs in reaching the top. We go several hundred feet forward, when suddenly we meet a switch and then backward the same length, right on the edge of the canyon, where one can look down thousands of feet to the water below. It certainly is a perilous journey and our only consolation comes from this advertised fact, "There has never been an accident on this road." The elevation here is 8,000 feet, and we gain another 3,000 is less than half an hour and reach Waldorf, where we mailed some post-cards from the highest government post office in the world, and were presented with a purple columbine, the state flower of Colorado.

It had been clouding up for some time and as we neared the summit, a furious thunder storm broke upon us, and the rain came down in torrents. I was soaking wet, but could not leave the open window for such a trifle. I shall never again witness a thunder storm without thinking of that one in the clouds, when the thunder rolled in our very ears, and the lightning flashed as it seemed, right on a level with our eyes and held me

spellbound. It was glorious as well as frightful. As the clouds parted a little, I promptly joined a search party for the ice palace, which I found as interesting as it had been pictured. Candles were stuck in the snow at the entrance. These the guide lighted for us and we found ourselves in what is supposed to have been a deserted mine, abandoned on account of the extreme cold. It is entirely incrusted with ice and snow. Long icicles hang from the center for a mile and a half and never melt. The only objection to this expedition is the temperature, which must have been around zero, as our rapidly benumbed fingers testified. This is as far as the railroad goes at present, 14,008 feet, or nearly three miles above the sea, so we hurriedly finished the journey on foot and became "puffers" at once, as it is an impossibility to hurry comfortably at such an altitude. The clouds seemed just a breath beyond and the earth a million miles below. But the train is about to start as the day is waning, so I reluctantly have to leave. Just a repetition of the wonderful sights of the morning, and as we finally leave the mountains I look behind and see the glorious sunset, great black peaks with a flood of gold behind, no other color, and it certainly did look like "Jerusalem the Golden" just beyond. I have always enjoyed the little things of life, I hope I always will, but it certainly is uplifting to gaze even once into the vastness of the Almighty.

The imports into the United States in 1909 amounted to $62,010,286, more than one-half of which consisted of laces and embroideries.

The value of the wool exported from Argentina to the United States in 1909 amounted to $6,778,944, as compared with $4,209,194 in 1908.

India now stands second to the United States in cotton production, and the exports last year, after the requirements of all the cotton mills and hand looms were fully met, amounted to about 2,000,000 bales, out of a crop of about 4,500,000 bales.

THE NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

A meeting of this association was held on November 19 at Reading, Pa. The principal subject discussed was that of estimating cost. Serious losses have been suffered by the trade by reason of price cutting resulting from a lack of uniform and reliable system of estimating cost. It was with the object of remedying this evil that the National Association began some months ago a movement to establish a uniform system of cost accounts for knitting mills. Much interest has been shown in the subject at the Reading meeting and the manufacturers present were enthusiastic in their approval of the plan. The following form of cost accounts was presented by Secretary C. B. Carter:

The items which enter into the cost system, considered at the meeting, are as follows:

1. Yarn .....lb.....oz.....at..... $.....
2. Lace ..... $.....
3. Tape ..... $.....
4. Thread ..... $.....
5. Buttons ..... $.....
6. Cambric (Facing) ..... $.....
7. Paper Boxes ..... $.....
8. Wood Cases ..... $.....
9. Needles ..... $.....
10. Nails ..... $.....
11. Knitting ..... $.....
12. Bleaching ..... $.....
13. Cutting Rolls ..... $.....
14. Cutting Shape ..... $.....
15. Cutting Sleeves ..... $.....
16. Cutting Gussets ..... $.....
17. Stitching ..... $.....
18. Over-seaming (Body) ..... $.....
19. Sewing Gussets ..... $.....
20. Sewing Sleeves ..... $.....
21. Over-edging (Body) ..... $.....
22. Over-edging Sleeves ..... $.....
23. Facing ..... $.....
24. Shelling or Lacing ..... $.....
25. Lacing Neck ..... $.....
26. Lacing Arms ..... $.....
27. Lacing Bottoms ..... $.....
28. Pants Bands (French) ..... $.....
29. Pants Bands (Straight) ..... $.....
30. Sewing Buttons ..... $.....
31. Button-Holing ..... $.....
32. Buttoning ..... $.....
33. Tacking ..... $.....
34. Turning Pants ..... $.....
35. Seaming Pants ..... $.....
36. Crocheting Pants ..... $.....
37. Sewing Lace ..... $.....
38. Fleecing ..... $.....

39. Crocheting Cuff Pants ..... $.....
40. Eyeletting ..... $.....
41. Mending ..... $.....
42. Taping ..... $.....
43. Trimming Ends ..... $.....
44. Inspecting ..... $.....
45. Pressing ..... $.....
46. Folding ..... $.....
47. Boxing ..... $.....
48. Casing ..... $.....
49. Extra Help ..... $.....
50. Superintendent ..... $.....
51. Office Help ..... $.....
52. Salaries—Owners ..... $.....
53. Interest ..... $.....
54. Wear and Tear ..... $.....
55. Insurance ..... $.....
56. Rent ..... $.....
57. Freight, Drayage & Express ..... $.....
58. Light, Heat, Power ..... $.....
59. Seconds ..... $.....
60. Discount ..... $.....
61. Commission ..... $.....
62. Bad Accounts ..... $.....
63. Miscellaneous Expenses: Postage, Printing, Stationery, Oil, Dues to the National Association of Hosiery & Underwear Manufacturers, Advertising, Drayage, Water Rent ..... $.....

This form will be submitted to the members for criticism and suggestions. The subject will again be considered at the next meeting in January. Secretary Carter has plans well advanced for the 1911 convention and exhibition, which is to be held in Philadelphia on May 22 to 26.

The following is a list of those present:

Walter M. Moyer, Reading Underwear Company, Reading and Ephrata, Pa.; J. R. Ammerman, Shamokin Underwear Mills, Shamokin, Pa.; Ed. Blood, Sr., J. Blood & Bro., Philadelphia, Pa.; J. C. Parsons, Parsons & Baker, Phoenixville, Pa.; Charles Baker, Parsons & Baker, Phoenixville, Pa.; Robert D. Pearson, Jewell Knitting Company, Bethlehem, Pa.; J. A. Scharadin, Orwigsburg Knitting Mill, Orwigsburg, Pa.; J. D. Berger, Berger Bros., Schuylkill Haven, Pa.; C. B. Carter, secretary-treasurer, Philadephia, Pa.; S. D. Bausher, Gotham Underwear & Bleach Works, Hamburg, Pa.; George W. Beckel, West Lawn Underwear Co., West Lawn, Pa.; George P. Stewart, West Lawn Underwear Company, West Lawn, Pa.; A. J. Fink, Hamburg Knitting Mills, Hamburg, Pa.; John Rems, John Rems & Sons, Macungi, Pa.; R. M. Rems, John Rems & Sons, Macungi, Pa.; H. C. Bolich, H. P. Bolich, New Ringold, Pa.; H. K. Deisher, H. K. Deisher, Kutztown, Pa.

The total value of the cotton goods imported into China in 1909 was $7,757,068, as compared with $4,611,246 in 1908 and $3,718,512 in 1907.

THE PATERSON INDUSTRIAL EXPOSITION.

The industrial exposition held in Paterson, N. J., November 9 to 19, marks an epoch in the silk industry. Although the exposition was devoted to all the industries of the city, silk manufacture came in for the largest space. That the manufacture of silk has a great interest for the general public was shown by the fact that close to 92,000 persons paid admission to the 5th Reg. Armory where the exposition was held, and on "Silk Manufacturers' Night" several thousand were turned away. No expense was spared by the Board of Trade in order to make the exposition a success.

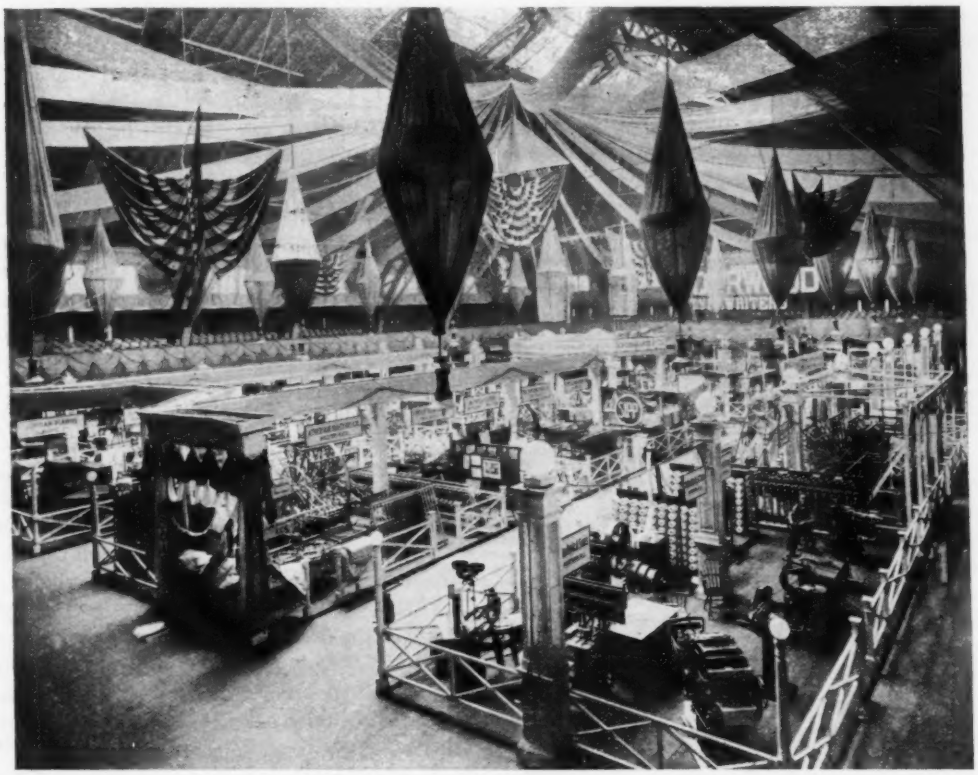
Over $10,000 was spent on interior and street decorations, and the show, started with no idea of being of any magnitude, assumed proportions in keeping with the prominence of the silk industry in Paterson.

Inside the armory there was a universal scheme of decorations and signs. The lines of booths were regular, except in the center, where a large circular booth was erected, on which the 5th Reg. Band rendered selections. The booths were each of 100 sq. feet and well enclosed by a fancy rail. The center line separating the booths was marked by fancy glass columns containing electric lights. The columns were surmounted by opal glass electric lighted globes, all making a very pleasing appearance. The colors of the exposition were purple and gold. These colors were used lavishly on the ceiling and side walls of the armory, presenting a very striking contrast to the white and green booths on the floor. The exposition was made up of many kinds of manufacturing and commercial exhibits, but the chief interest seemed to be centered in the silk section. Here there were 60 to 70 booths showing the various processes of silk manufacture from the cocoon to the finished gown. The only feature of the silk production being missed was that of silk throwing. The cocoon reeling was a great novelty even to the expert silk worker of Paterson, where 40,000 or more persons depend on silk manufacture for a livelihood. Two expert Italian operatives had charge of the cocoon ex-

hibit, which was daily surrounded by an interested audience. Winders, quillers, warpers, looms and other silk machinery in operation were shown at the various exhibits, and the throngs surrounding the machines were tangible evidence of the interest that the world takes of the silk fabric.

shown in several booths. The colored silks on the warping frame joined with those on the winding and quilling machines made a beautiful sight, much appreciated by those who attended the exposition.

While the silk manufacturing section came in for its share of the patronage and inter-



A VIEW OF THE EXPOSITION FROM THE GALLERY.

The ribbon looms especially came in for a great share of attention, and it was a hard matter, day or night, to get near the booths in which the ribbon looms were installed, inasmuch as persons seemed to be fascinated by the workings of the many shuttled machines operated by the most experienced weavers. Broad silk weaving also came in for a great share of attention, and here the public was treated to the novelty of seeing a printed warp being woven.

Warping machines in operation were

est, one of the drawing cards of the exposition was the display on living models of gowns made of Paterson silks. This feature was presented on a platform in the gallery of the armory. Eight young ladies were used to display the gowns which were made up for evening and street wear. The gowns were designed by members of the United Ladies' Tailors Association of New York, under the direction of their president, Alexander M. Greau. This feature of the exposition was put on for one week only and was

instrumental in adding to the crowds attending.

While there was a room in the armory devoted to an exhibition of Paterson art, the feature of this part of the exposition that drew the most attention was examples of woven art, that were shown in the large music room. These pictures had been collected from all parts of the world, and were loaned to Samuel McCollum, chairman of the silk manufacturers' committee. Upwards of one hundred specimens were shown. Interest was added to this exposition by the exhibition of the designs of some of the woven pieces, showing the work that card cutters had to prepare the designs for the jacquard looms. One of these specimens was a reproduction of the Paterson city hall, beneath which appeared the slogan of the exposition in purple and gold. This example of woven art was made by The Holzman Silk Co. on a Crompton-Knowles loom. They had all they could do to supply the demand for these souvenirs.

Monday, November 14, was silk manufacturers' day, and the Silk Association of America, and the silk throwsters of America were the guests of the exposition committee. Jerome C. Read, president of the Silk Association of America, complimented the committee on the excellence of the exposition from a silk manufacturers' standpoint. P. R. Rownan, president of the throwsters' association, spoke highly of the exposition. About a dozen of the Board of Managers of the National Association were present at a dinner given in their honor by the Paterson Board of Trade at the Hamilton Club, one of the best appointed club houses in New Jersey. Visitors to the exposition were from every silk firm of prominence in the metropolitan district. Nearly all of the commission houses interested in silk sent their salesman to see the exposition, and as a means to create interest in the silk industry it was a big success. Among the machinery exhibitors at the exposition were the following: Crompton & Knowles had ribbon looms running. The Universal Winding Co. were quilling silk direct from the skein and from spools. The Westinghouse Electric Co. had a number of their latest type individual motors on exhibition, also two type G motors. I. A. Hall had a very neatly arranged exhibit of his many supplies for the textile trade. The Schaum & Uhlinger Co., of Philadelphia, showed their silk looms and hydro-extractors. Alfred Suter, textile engineer, of the Silk Exchange, N. Y., exhibited and demonstrated some of his yarn and cloth testing apparatus, and also a reeding machine, which attracted the attention of many visitors. He also showed the well known calculating disks and cylinders from E. Billeter of Zurich. Another interesting exhibit was that of Warp Twisting-in Machine Co. of Brooklyn, who had one of their twisting-in machines demonstrating its efficiency. Groton & Knight of Worcester showed their belts running through water, demonstrating their lasting qualities in damp places. John W. Ferguson, contractor and builder, had many large photos on exhibition of work done in different parts of the country. The Stafford Co. showed their automatic looms adapted for silk weaving to advantage, while the well known chemical firm of Roessler, Hasslacher Co. of New York showed mill samples of peroxide bleaching. The Buckeye Electric Co., through their agents, had an exhibit of their superior mill lighting apparatus, showing many styles of lamps. Among other manufacturers and mill supply people noticed were the following: S. H. Mayhew & Co., McCollum & Post, Miesch Mfg. Co., Paterson Knitting Co., McNab & Harling, Sweeney & Buser, C. E. Mueller Mfg. Co., American Silk Dyeing and Finishing Co., National Silk Dyeing Co., Weidman Silk Dyeing Co., Fairbanks Co., Clover Leaf Co., Harding Box Co., R. & J. Dick, Crane Co., Atherton Mch. Co., Sipp Mch. Co., Benj. Eastwood Co., Wm. C. Keyworth and Aronsohn & Bloom. Many visitors interested in silk machinery visited these booths and were pleased with the new devices shown on looms, winders, quillers and other machines. The silk manufacturers in general all spoke highly of the value and benefits of this exposition, and it is very likely that there will be a repetition of the exposition in the near future.

THE NATIONAL ASSOCIATION OF WOOLEN AND WORSTED OVERSEERS.

The twenty-eighth semi-annual meeting of the National Association of Woolen and Worsted Overseers was held Saturday, November 19, at Faneuil Hall, Boston, Mass. About two hundred members were present.

The meeting was called to order by President F. P. Gallagher and the ballot for the election of officers resulted in the reelection of the present incumbents by a large majority.

Secretary Walter Pickford read the minutes of the last meeting which was held last May at Providence, R. I.

A large number were present to answer to their names and be enrolled as members. C. M. Hirst and Louis Carmack were appointed a committee to escort the newly elected members to the hall. They were presented with membership cards.

John W. Linnehan, a member of a committee to consider a report upon organizing a labor bureau, presented a written report which the secretary read to the members present.

The following officers were elected:

President—F. P. Gallagher.
First Vice-President—James H. Pickford.
Second Vice-President—J. T. Dolan.
Third Vice-President—R. J. Hill.
Secretary—Walter Pickford.
Treasurer—Thomas Buchan.
Secretary Beneficiary Department—H. G. Buchan.
Treasurer Beneficiary Department—Thomas Buchan.
Trustees—Louis Carmack, James McDowell, C. M. Hurst.

It was resolved that the next meeting be held at Providence, R. I. The banquet was held at the Elks' Home.

The following is a list of those present

CONNECTICUT.

Samuel H. Walsh, Putnam.
J. J. Burns, Moosup.
J. E. Bradley, Rockville.
Robert J. Carle, Mechanicsville.
I. D. Martin, Danielson.
W. E. Davison, Putnam.
Fred Hollingsworth, Norwich.
George H. Ashton, Rockville.
H. G. Morey, Danielson.
C. M. Ellis, Putnam.

MAINE.

John F. Leonard, Oakland.
J. H. Johnson, Oakland.
David F. Stewart, Skowhegan.
William Mackintosh, Bridgeton.
C. H. Speak, Fairfield.
M. C. O'Brien, Old Town.
Geo. H. Newry, Dexter.

MASSACHUSETTS.

John Lawton, Maynard.
T. E. Moore, Webster.
Thomas Lyons, Pittsfield.
E. Fred Deverall, Clinton.
C. R. Howarth, Careyville.
Lees Hall, Lawrence.
R. A. Guyimme, Fitchburg.
James Speed, Boston.
W. J. Degnan, Auburn.
J. F. Geb, Franklin.
Edward F. McGlone, Uxbridge.
J. T. McCormack, Hyde Park.
J. W. Linnehan, Boston.
Adolph Felgentragee, Holyoke.
F. H. Briskby, Lowell.
Frederick Reinshausen, North Andover.
Thomas Byron, Saxonville.
Chas. Spurr, West Stoughton.
Jas. E. Perkins, West Stoughton.
Frederick W. Kennedy, Lawrence.
David W. Fox, Rochdale.
John J. Lyons, Pittsfield.
John J. Henderson, Cordaville.
John J. Deavitt, Lowell.
Thomas Lenehan, Lowell.
W. H. Hassett, Worcester.
Jas. A. Lapraik, North Billerica.
Archibald Ormiston, Concord Junction.
Wm. C. Hay, Uxbridge.
D. F. Welsh, Cherry Valley.
John E. Graham, Lowell.
Frazier L. O'Leary, Boston.
James H. Pickford, Clinton.
Lees Melanson, Worcester.
Thomas Buchan, Hyde Park.
Walter Pickford, Clinton.
D. J. Byers, Farnumsville.
G. H. Schellschmidt, East Douglass.
Richard Thomas, Lawrence.
E. B. Flannagan, North Bellingham.
J. E. Flannagan, North Bellingham.
L. M. Allison, Worcester.
H. E. Whittaker, North Andover.
J. W. Whitehead, Lowell.
Leo Shindler, Monson.
John Gagan, North Andover.
W. T. Loomis, East Douglass.
F. L. St. George, North Bellingham.
Walter Nieber, North Bellingham.
A. C. Neff, Millburg.
George Riddell, Plymouth.
James H. Cobb, Careyville.
Henry Shaw, Leominster.
Geo. Wishart, New Bedford.
George A. Rodgers, Clinton.
Donald C. Bucan, North Andover.
F. W. Birkinshaw, Watertown.
A. C. Fredericks, Pittsfield.
James J. Rae, Cherry Valley.
J. N. Larose, Cherry Valley.
Herbert Midgeley, Worcester.
Henry C. Templeton, Lowell.
George Fraser, New Bedford.
Thomas Richmond, Cherry Valley.
Noel Tutin, Concord Junction.
F. A. Hardy, Lowell.
Oland Comstock, Lowell.
Jos. E. Armory, Millbury.
E. H. Jones, North Andover.
Michael H. Shea, Dalton.
John Hartley, Monson.
James H. Lawler, Lowell.
C. T. Donlevy, Boston.
M. J. O'Brien, Lawrence.
Benjamin Horsfall, Lowell.
George H. Thomas, Lowell.
Brook Southan, Lowell.
William McConachie, Clinton.
Hyram Rathburn, Byfield.
Fred F. McAvoy, Fitchburg.
H. C. Stevens, Boston.
Albert Newbury, Clinton.
John Ogden, Lowell.
O. F. Ireland, West Somerville.
John C. Marley, Lawrence.
Frank Manock, Lawrence.
H. S. Shulze, Maynard.
D. P. Scribner, Waltham.
Symon P. Kenny, North Andover.
John F. Drummond, Lawrence.
Jacob Ashler, Webster.
R. G. West, Charlton City.
Jas. F. Scott, Ballardvale.
Fred Hollingsworth, Norwich.
H. E. Meyer, Uxbridge.
Jos. Carter, Uxbridge.
Alex. T. Carmichael, North Andover.
John Sheehan, North Andover.
James Magner, Maynard.
P. E. Reily, Uxbridge.
Thomas Thomas, Lowell.
Thos. Prendergast, Newton Upper Falls.
D. Duffy, North Bellingham.
R. B. Robinson, Franklin.
John Dobbs, Lowell.
W. S. O'Brien, Hudson.
Jas. H. Hillens, Lawrence.
E. S. Eddy, Worcester.
J. J. Wehinger, North Adams.
S. J. McIntire, Collinsville.

NEW HAMPSHIRE.

Alfred E. Jones, Hillsboro.
J. E. Gilroy, Hillsboro.
T. N. Parent, Franklin.
Christopher Patton, Tilton.
E. P. Sweeney, Lebanon.
Clarke Partello, Franklin.
J. T. Patterson, Franklin.
F. S. Klebart.

NEW YORK.

Jos. Sykes, Malone.
W. E. Owens, Brooklyn.

PENNSYLVANIA.

Jas. Gibbs, Philadelphia.
John F. Bolger, Philadelphia.

RHODE ISLAND.

Francis P. Gallagher.
Jos. T. Doland, Harrisville.
Thomas Donohue, Woonsocket.
Julian G. Guerin, Woonsocket.
F. A. Fraser, Glendale.
F. W. Clarkson, Tarkhill.
Edgar M. Taft, Bridgton.
George E. Templeton, Greenville.
W. E. Chamberlain, Woonsocket.
Albert E. Riley, Providence.
Louis Carmark, Providence.
Herman Ambach, Lymansville.
Ephriam Bedford, Thornton.
J. J. Farren, Manton.
Jas. Southwell, Providence.
Squire Kershaw, Greystone.

WOOL CLIP OF PRINCE EDWARD ISLAND.

Consul Frank Deedmeyer, Charlottetown, Canada, sends the following report to the State Department:

Sheep raising has declined in Prince Edward Island as well as in the other Provinces of Canada.

In the Dominion census year 1871 the returns showed 3,155,509 sheep; in 1891, 2,563,781, and in 1901, 2,510,239. The provincial returns for all Canada for 1909 give the total number as 2,705,390. Prince Edward Island had in 1881 166,496 sheep; in 1901, 125,546, and their number this year is put as low as 80,000. The wool slip of this Province is estimated for 1910 at 350,000 pounds. The best prices paid here this year were in July and August, when tub-washed wool brought 25 cents per pound. Only a small percentage is worked up locally; nearly the entire clip goes to the mills in Ontario and Quebec. None is shipped to the United States.

Notwithstanding the rapid development of agriculture in almost every branch, advancing meat prices and unlimited pasturage, the raising of sheep in Canada has made no advance in the last ten years. This is attributed to the general introduction of sharp wire fencing and to the inadequacy of legal regulations tending to restrain the running at large of unmuzzled dogs. The average price paid in all Canada in 1909 for domestic unwashed wool was 17 cents per pound; for washed, 24 cents.

The following table shows the imports by Canada of raw wool during the last ,five years, in pounds:

Year	Total Imports	From United States	From United Kingdom
1905	7,617,211	1,431,524	4,071,031
1906	6,311,837	1,557,208	2,799,872
1907	3,928,791	686,368	2,446,983
1908	6,129,216	1,463,620	2,680,754
1909	5,683,948	1,203,308	2,797,759

The total imports of 1909 were valued at $1,042,662. The Republic of Argentina contributed nearly 500,000 pounds in 1909.

The exports of raw wool from Canada were, in pounds:

Year	Total Exports	To United States	To United Kingdom
1905	1,971,501	1,556,691	413,519
1906	1,424,795	1,217,957	260,039
1907	1,229,390	983,404	223,347
1908	1,848,318	1,629,730	211,522
1909	1,080,824	912,586	166,678

The duty levied by Canada on sheep's wool is 2 cents per pound when imported from the United Kingdom and the reciprocating British colonies, and 3 cents when imported from other countries.

RAMIE'S RECORD.

(By Our Special Correspondent.)

The appearance of a book on the subject of ramie culture and manufacture is the latest sign of the unwillingness of ramie "experts" to allow this unhappy fibre to die its natural death. A small band of men in England with secrets to sell and companies to promote, maintain in season and out of season a noisy press publicity vaunting the supposed advantage of this substance over all other fibers. The praises range from the merely silly to the actively dangerous and necessitate from time to time some counterblast.

At one time the campaign is directed toward planters in the tropics and designed to cause them to grow a crop that will almost certainly land them in serious loss.

At another time the manufacturer is the mark and he is rallied and reproached for neglect of ramie. Again the ultimate consumer is fed with astonishing statements. In an article before me the consumer is told that with ramie he can have "web for underclothing of rich blues and crimsons, of wonderful sunset glow." The sunset glow is very characteristic of the regular public statement made about ramie and the seriously minded can be warned unreservedly to look at no ramie in its colder tones.

Chance has brought the writer into more or less close touch with several English attempts to utilize the ramie fiber and with a large number of people who have sought to employ it in one form or another. These experiences form the basis of what is set

down here and they are related with entire impartiality. Ramie has been a failure. Out of at least a score of English attempts to treat the raw ribbons only one is known to be at present profitable and in this case the profits arise not from ramie so much as from the prices realized for the incandescent gas mantles into which the fiber is made. Ramie has failed in the hands of large and competent firms like M. C. Thomson's, Glasgow, Mark Dawson's, Bradford, and linen companies in Belfast. It has failed in the hands of capitalists like Captain Ferguson (Scotland), and of woolen men at Wakefield and silk men at Rochdale. It has failed under the fostering care of experts and geniuses at Long Eaton, Brighouse, Halifax, Leeds, Salford, Bradford and Huddersfield. It has failed twice and three times over in some of these places and has failed consistently for forty years of which accurate account is available. At one time and another the money of the Rothschilds, of Joseph Chamberlain and Sir T. J. Lipton have, it is said, been drawn on for ramie. But the fiber that has been the coming thing so long as the oldest men in the textile business can remember, has still not come to any substantial good.

The people who tried to extract the fiber have not flourished and efforts to utilize the fiber when extracted have been unfortunate also. Ramie freed from gum and dressed or combed, has been mixed with spun silk in the drawing process and the only outcome of that has been to make the yarn an unmarketable commodity. Many attempts have been made to draw ramie and worsted to produce a mixture effect in dyeing. The ramie deadens the wool and refuses to mix equally with it. They have tinted the vegetable fiber so that its mixing could be followed with the eye and have adopted every expedient that experience could suggest, but to no purpose.

Ramie yarn has been used solid and might be used still for such purposes as fancy work and the stitching of ornate headings on fabrics, but mercerized cotton has been perfected and is a brighter, more uniform and altogether more satisfactory yarn to use. Ramie yarn in general is not cheap enough for coarse uses and not perfect enough for fine purposes. The enthusiasts brag of the strength of ramie yarn and adduce the well-worn table of comparative strengths as once ascertained upon some Rochdale samples by the Manchester Testing House. A summary of the table is appended:

Rhea		Cotton	
Count	Strength	Count	Strength
10.2	36.6 lbs.	10.7	12.8 lbs.
15.4	17.3 lbs.	15.1	10.6 lbs.
15.2	19.1 lbs.	17.1	5.2 lbs.
19.8	19.2 lbs.	16.9	10.0 lbs.
27.7	4.5 lbs.	29.2	3.7 lbs.

Rhea (the Indian name for ramie) is strong, but to discover its weakness tie a knot in the yarn and see how many pounds or ounces will break it then. The writer has the best means of knowing that yarn from the mill that produced these tested lengths was not all of this strength. Because of alkali left after degumming or bleaching, quantities of this material rotted in stock and this defect has been exhibited in other makes. The luster of ramie is vaunted, but anyone who will get a hank gassed and dyed may see how the luster lasts. Mere opening and shaking out of the hank is enough to burst out the ends of the fiber in most instances and the luster is promptly hidden underneath a shaggy beard.

There may be ramie yarn that has been freed entirely from shives and gums and resins and is unmarred by slubs or "silver-ends." If so, that yarn is not known so well as it should be and it is to be doubted whether more than a sample hank of it exists. Ramie bleached is almost invariably harsh in handle and ramie in all cases is heavy and devoid of elasticity. The author of the new book "Ramie" repeats on somebody's authority the fatuous statement that ramie is suitable for making plush. Having seen plush made from it and having ascertained by practical experiment the fact that the pile once crushed does not recover its position, the alleged suitability may be confidently denied.

The still more reckless statement is made

that ramie is excellent for fire hose piping. Well, ramie has been used for this purpose and it drenched the brigade. Unlike cotton, ramie does not contract with wetting, the interstices in a ramie hose pipe do not close and water leaks from every pore of it.

Ramie is very inflammable and for that reason commission dressers and combers have been known to refuse to take it into the mill. Commission spinners decline to spin ramie in rooms in which worsted or other material is being spun as ramie fibers fly in all directions about the room. The monotonous story of the bad in ramie may be broken with some references to the good. Strength and immunity from contraction in moisture qualify ramie for use in making driving ropes and spinning bands. These advantages are offset by the readiness of ramie to break at any joining and despite persistent attempts the production of these has attained no important dimensions. An enthusiast engaged in a small way in making ramie spinning bands has demonstrated on paper that he can make cent per cent on a capital of $15,000, but the capital has not been put up and the estimate has not been subjected to test and need not be accepted beforehand.

Ramie is always marketable in the form of noils and were it possible to make a profit on bleached noils at 10 cents a pound, ramie would indeed be a competitor of the older fibers. To sell noils at 10 cents one has to sell the top at about 42 cents and the top is less flexible in its use. The noils go for blankets, for fancy yarns and for bandages. Ramie's high absorptive powers make it excellent for the last-named goods.

However, ramie is not cheap enough to compete with cotton. China-grass, the hand-stripped, boiled and beaten bast treated by natives about Hankow, costs 6 cents a pound in China on the average of late years and on occasion rises to £60 a ton in London. Rhea ribbons are got from India and Burma for 3 cents a pound upwards. They are sometimes black and fermented, encumbered with much woody matter and brown cuticle and with all sorts of knot intervals along the stalk. At best, the original cost is doubled in producing a spinnable filasse and on combing the loss is anything between 20 and 70 per cent.

It has been complained to me by one of the dupes who lost his little all in the vain endeavor to make ramie commercially successful that there is no reckoning with the vagaries of the market or with the differences of quality in the successive lots received. The supply of ramie is limited and any new demand sends up the price. To obtain constant supplies one has to make a contract to take a specified number of tons a month. It is almost impossible to judge the yield from any sample of raw material and in the present conditions one has to take the delivery that is tendered, be it first, second, third or fourth crop, good or bad, right or wrong.

These uncertainties of supply of course do not interfere with the sanguine estimates of the company promoter. I quote from the prospectus of a company as a specimen of the kind of calculation the ramie enthusiast makes. He buys two tons (4,480 pounds) at £28 ($140 a ton) costing 6 cents per pound and out of this sells 2,000 pounds of yarn at $1.16 per pound and in this ingenious manner makes a profit of some $1,385 per week on paper. The defects common to ramie estimates in general appear here in their usual form. You cannot buy China grass at the price and the market price for yarn is in the neighborhood of 60 cents per pound. But by underestimating by 50 per cent. the cost of material, overestimating by 100 per cent. the value of product and ignoring entirely the item of noils, the fabulous result is very easily reached. Any profit desired can be reached in the same manner and in point of fact has been reached by the subjects of ramie hypnotism.

It has been said with some show of authority that ramie has been the source of a loss to planters and manufacturers of some $150,000,000 in the last fifty years. The figures are beyond verification, but they cannot include the fortunes that victims of the ramie delusion have pencilled out or chalked up on mantelpiece and blank walls. These

unrealized sums surpass the bounds of arithmetic and trespass on the verges of eternity.

Many fortunes have been lost in ramie and it is not difficult to trace a few million dollars that manufacturers have dropped. No fortunes have been made out of the fiber and one concern alone in all the world has shown itself able to maintain dividends for a length of time out of working this material. The shining exception is Erste Deutsche Ramie Gesellschaft, Emmendingen, Germany, and say what one will, the fairly established success of a single mill is not a certificate of the universal utility of a fiber that has been known to the Western world for three hundred years and that has been the subject of industrial experiments for about a century.

The further development of ramie received a check in the popularization of mercerized cotton and there is no saying what it may receive from further developments of substances like artificial silk. Until it can be grown at a low price and until it can be degummed more certainly and at less expense than at present, ramie is unable to set the textile world on fire. Ramie has had a qualified success as a hygienic or faddist kind of underwear and ramie, owing to its absorbent faculties, has proved to be a suitable material for knitting into gas-mantles requiring impregnation with luminous earths. Outside these special fields ramie has made no considerable headway against cotton, flax, wool or silk.

The Textile World Record's Report of Mill Construction for 1910.

Two hundred and seventy-four new textile mills were built or under construction in the United States in 1910. This is a distinctly gratifying result in view of the adverse influences that have affected the two principal branches of the trade, cotton and wool manufacturing. The cotton industry has had to contend with a comparatively high price for the raw material, while wool manufacturers have been handicapped by a political agitation that, while affecting all branches of the trade, has had a particularly severe effect on the trade in wool goods. Despite these influences the total number of new mills is very little less than in 1909, and is larger than in 1908 or 1907.

COMPARISON OF NEW MILL CONSTRUCTION FOR LAST TEN YEARS.

	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901
Cotton	67	80	47	64	74	33	48	81	68	59
Woolen	31	47	23	25	56	38	45	65	46	53
Knitting	113	105	94	83	103	79	111	105	82	93
Silk	34	37	33	51	36	53	49	58	45	29
Miscellaneous	29	20	25	30	34	42	37	25	21	21
	274	289	222	262	303	245	290	334	262	255

The knitting branch of the business shows an increase over 1909. The cotton and silk branches fall slightly behind last year's record, while the largest decrease is in woolen and worsted mills, which number 29 in 1910, as compared with 47 last year.

The direction of the development in cotton manufacturing is clearly shown by the distribution of new spindles. New England claims 468,714 spindles installed in 1910, as compared with 599,000 in 1909, a decrease of 22 per cent., whereas the Southern States report only 214,028 spindles this year, as

NEW COTTON MILLS.

New England	No.	Spindles	Looms
Connecticut	3	....	25
Massachusetts	13	408,276	5,412
Rhode Island	9	25,000	30
Vermont	1	35,438	650
	26	468,714	6,117
Southern States			
Alabama	2	10,000	200
Georgia	4	22,500	250
Mississippi	1	5,000	....
North Carolina	10	52,848	582
South Carolina	6	85,680	1,870
Tennessee	1	13,000	....
Texas	2	5,000	550
Virginia	2	13,000	300
	28	214,028	3,752
Middle & Western States			
New Jersey	2	2,500	30
New York	5	.....	24
Oklahoma	1	10,000	300
Pennsylvania	5	.....	15
	13	12,500	369

compared with 527,528 spindles last year, a decrease of 60 per cent. Two-thirds of the new spindles installed in the United States in 1910 are to be found in New England. This is the result of well known conditions in the trade. The manufacture of coarse goods has been hit the hardest by the advance in the price of cotton, because so large a part of the cost of such goods is for raw cotton. In the cost of fine goods, on the other hand, labor is a much more important item than in low goods. Thus it is that an increase in the cost of raw cotton affects the production of low grade goods most. As a result we find the development of cotton manufacturing retarded chiefly in the South where the product is mainly the low and medium goods. In New England a much larger proportion of the product of the cotton mills consists of fine goods.

COMPARISON OF SPINDLES IN NEW COTTON MILLS FOR THE LAST ELEVEN YEARS.

	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900
New England	468,714	599,000	115,000	113,000	171,000	100,800	161,184	135,000	347,320	30,000	1,185,700
Southern States	214,028	527,528	91,193	294,745	294,956	97,920	55,472	281,752	490,256	259,360	109,584
Middle and Western	12,500	79,968	3,500	10,250	27,040	.....	.....	.....	25,000	2,064	11,500
Totals	695,242	1,206,496	209,693	417,995	492,996	198,720	216,656	416,752	862,576	291,424	1,306,784

The twenty-nine woolen and worsted mills are classified as follows: Sixteen worsteds, 7 carpets and rugs, 2 knitting yarn, 2 felt, 1 blanket, 1 satinet.

The gratifying increase in the number of new knitting mills is due in a large degree to the new uses for which knit fabrics are being developed. The tendency of knit goods manufacturers to concentrate in the Middle States still continues, Pennsylvania being far in the lead this year, as was also the case in 1909.

The number of silk mills for 1910, although slightly behind the 1909 total, is about equal to the average for the preceding two years. New Jersey and Pennsylvania claim 29 of the 34 for this year, there being no indication that the development of the silk business is likely to deprive these two States of their preeminence in this branch of manufacturing.

The detailed report of the new mills, enlargements and improvements, will be found on the following pages.

NEW WOOLEN AND WORSTED MILLS.

New England	No.	1910	1909	1908	1907	1906	1905	1904
Connecticut	5							
Massachusetts	6							
Rhode Island	2							
		13						
Middle States								
New Jersey	1							
New York	4							
Pennsylvania	9							
		14						
Western States								
Ohio	3							
Washington	1							
		4						
		31	47	22	25	56	38	45

NEW SILK MILLS.

		1910	1909	1908	1907	1906	1905	1904
California								
Broad	1							
		1						
Connecticut								
Silk Yarn	1							
		1						
Massachusetts								
Broad	1							
		1						
New Jersey								
Silk Yarn	2							
Broad	10							
Ribbon	1							
Miscellaneous	1							
		14						
New York								
Ribbon	1							
		1						
Pennsylvania								
Broad	6							
Ribbon	4							
Silk Throwing	3							
Artificial	1							
Miscellaneous	1							
		15						
Rhode Island								
Silk Throwing	1							
		1						
Total		34	37	32	51	36	53	49

NEW KNITTING MILLS.

New England States	1910	1909	1908	1907	1906	1905	1904	1903
Connecticut	1							
Massachusetts	5							
New Hampshire	1							
Rhode Island	1							
	8							
Middle States								
New Jersey	4							
New York	13							
Pennsylvania	55							
	72							
Western States								
Illinois	2							
Indiana	2							
Michigan	3							
Ohio	3							
Oklahoma	1							
Washington	2							
Wisconsin	4							
	17							
Southern States								
Georgia	2							
Louisiana	1							
North Carolina	8							
Tennessee	2							
Virginia	3							
	16							
	113	104	92	83	103	79	111	105

New Mill Construction During 1910.

(A summary will be found in the Monthly comment of this issue.)

EXPLANATIONS OF ABBREVIATIONS: 12/10=Expect to start December, 1911, etc.; S=Steam; W=Water Power E=Electricity; D=Dye House.

NEW COTTON MILLS.

ALABAMA.

Jacksonville. Verlina Mills; Geo. P. Ide, A. H. Robbins, H. R. Rice, props.; Turkish Towels and Fancy Cotton Weaves. (E).. .. 200

Ragland. Brown Cotton Mills; $250,000; W. T. Brown, J. A. Thomas and S. P. Hagan, interested; Cotton Yarns. (S) .....10,000 ..

CONNECTICUT.

Danielson. Connecticut Mills Co.; R. L. Fisher, treas.; William B. Fitts, sec. and mgr.; Fine Sea Island and Egyptian Cotton Fabrics. 35

Hartford. Hartford Thread Co.; A. C. Loveland & Co., treas.; Wm. Forsyth, supt. and buyer; Spool Cotton. (S) ....

Norwalk. Dresden Lace Works; Richard Muller, mgr. and buyer; Laces. (S & E).. .. ..

GEORGIA.

Columbus. Meritas Mills; $350,000; Alvin Hunsicker, pres.; W. T. Thatcher, treas.; J. T. Broadbent, agt.; Drills and Duck. (E) (Begin mfg. March, 1911.) 10,000 170

Monticello. Jasper Cotton Mills; $225,000; L. O. Benton, pres.; Cotton Yarns. (E) .....10,000 ..

Senoia. Senoia Duck Mills; $100,000; C. G. McCranie, pres. and mgr.; N. G. Long, vice pres.; Vindex Hands, sec. and treas.; W. L. Beyer, supt.; Duck. 90

Villa Rica. Villa Rica Cotton Oil Co.; $150,000; B. F. Floyd, gen. mgr.; Cotton Yarns. (S) ..... 2,500 ..

MASSACHUSETTS.

Assonet. Puritan Mills; $50,000; Herman G. Myers, pres.; Edwin Blinn, treas., agt. and buyer; Products from Cotton Waste, Yarns, Batts, Twine, Waste. (W) ..... 3,584 ..

Fall River. Charlton Mills; $800,000; E. P. Charlton, pres.; James Sinclair, treas.; Fine and Fancy Cotton Goods. (S) (Buildings under construction.) 52,000 1,300

Lawrence. Barlow, John W. Co.; $10,000; Thomas Bevington, pres.; A. Barlow Bevington, treas.; Joseph McPhee, supt.; Cotton, Linen, Jute and Worsted Banding, Tapes and Webbing. (S) 7

Lowell. Massachusetts Cotton Mills; capital increased from $1,800,000 to $3,000,000; building spinning and weaving mill, 5 stories, 310 by 90 ft.; extension to carding mill, 5 stories, 125 by 95 ft.; power house, 285 by 50 ft.; storehouse with capacity of 45,000 bales. 52,692 1,105

Lowell. Merrimack Utilization Co.; $25,000; C. P. Baker, pres.; E. N. Lovering, treas.; A. L. Sharp, gen. mgr.; Cotton Waste. ....

Methuen. Carribee Mfg. Co.; L. E. Barnes, pres.; J. D. Armitage, treas.; Wallace Major, sec.; Narrow Fabrics and Tapes... .. ..

New Bedford. Booth Mfg. Co.; $1,250,000; Wm. L. Mauran, pres.; F. R. Brown, treas.; Geo. H. Booth, agt.; Fine Cotton and Silk Cloths. (S) (Under construction.) 50,000 1,300

New Bedford. Kilburn Mill; increased capital stock from $750,000 to $1,500,000 and built new cotton yarn mill. .....50,000 ..

New Bedford. Neild Mfg. Co.; $800,000; Rufus A. Soule, pres.; Joseph A. Allen, treas.; John Neild, gen. mgr.; Fine Cotton Yarns and Cloth. (S) 60,000 1,700

New Bedford. New Bedford Textile Co.; $5,000; M. T. Glennon, pres.; Chas. R. Gidley, treas.; Textile Bands. (S) ....

New Bedford. Quissett Mill; $1,000,000; Wm. M. Butler, pres.; E. H. Cook, treas.; Thos. F. Glennon, agt.; Fine Cotton Yarns. (S) (Under construction.) .....80,000 ..

New Bedford. Sharp Mfg. Co.; $1,500,000; Joseph T. Kenney, pres.; Arthur R. Sharp, treas. and gen. mgr.; Robt. Schofield, supt.; Fine Combed Yarns. (Under construction.) .....60,000 ..

Worcester. Dudley Mills Co.; $25,000; Philip E. Dudley, pres. and treas.; Harold F. Sherman, supt.; Cotton and Silk Fabrics... .. ..

MISSISSIPPI.

Meridian. Priscilla Mills; capital increased to $130,000 to build a cotton yarn mill; main building, 2 stories, 50 by 150 ft.; boiler and engine room, 50 by 60 ft. ..... 5,000 ..

NEW JERSEY.

Bridgeton. Preston, Geo. W., Co.; $100,000; Geo. W. Preston, pres. and supt.; J. Warren Miller, treas.; Turkish Towels, Terry Cloth Novelties. (S & E) 30

Pluckamin. Superior Thread & Yarn Co.; Weaving and Knitting Yarns and Threads. 2,500 ..

NEW YORK.

Homer. Newton Line Co.; D. D. Newton, A. W. Gibbs and M. A. Whiting, props.; M. A. Whiting, supt. and buyer; Fish Lines; 251 braiders. (S & W) ....

Jamestown. Jamestown Towel Mills; $5,000; R. P. Stewart, pres.; T. R. Sampson, treas.; John T. Hall, supt. and buyer; Turkish and Huck and Union Huck Towels; (E); bleach and finish. 24

Little Falls. Dingman Co., Mohawk St.; $12,000; James E. Dingman, pres. and supt.; G. W. Norris, treas. and buyer; Cotton and Jute Bats, Mattress Felts and Shoddies. (W) ....

New York City. Liberty Lace & Netting Works; office, 11 E. 16th St.; plant at Williamsbridge; $100,000; Eugene Metzger, pres.; Hugo N. Schloss, sec. and treas.; Wm. Taylor, supt.; Laces, Veilings and Nettings. ....

Saratoga Springs. Binch, F. & Co.; F. Binch, mgr. and buyer; Laces and Fancy Nets. (E) ....

NORTH CAROLINA.

Chapel Hill. Lloyd, T. F., Mfg. Co.; $200,000; Thos. F. Lloyd, pres.; J. W. Pritchard, treas.; Cotton Yarns. .....10,000 ..

High Point. Pickett Cotton Mills; $250,000; Robt. L. Steele, pres.; F. M. Pickett, treas.; Cotton Goods. (E) Under construction. 12,000 300

Kings Mountain. Pauline Mills; Chas. E. Neisler, prop.; Table Damasks. 32

Landis. Corriher Mills Co.; $40,000; C. J. Deal, pres.; L. A. Corriher, sec. and treas.; Sheetings. ....

Lumberton. Jennings Cotton Mill Co.; $250,000; H. B. Jennings, pres. and treas.; F. P. Gray, sec. and asst. treas.; Cotton Hosiery Yarns. ..... 8,000 ..

Salisbury. Hambley Mfg. Co.; $125,000 (authorized); C. C. Adams, pres.; Gilbert F. Hambley, treas. and mgr.; Cotton Damask. (To build mill spring, 1911.) 50

Thomasville. Amazon Cotton Mills; $150,000; J. W. Cannon, pres.; C. G. Hill, sec. and treas.; Cotton Yarns. ..... 5,800 ..

Thomasville. The Jewell Cotton Mills; $100,000; J. L. Armfield, pres.; T. J. Lillard, treas.; C. H. Boyd, supt.; Fine Combed Cotton Yarns. (E) ..... 6,048 ..

Winston-Salem. Hanes, P. H., Knitting Co.; increased capital to $250,000; built cotton yarn mill, 137 by 477 ft., cotton warehouse and power house. .....10,000 ..

Winston-Salem. Inverness Mills Co.; $200,000; H. G. Chatham, pres.; Lawrence McRae, treas., agt. and buyer; Print Cloths. (E) 8,000 200

OKLAHOMA.

Oklahoma City. Oklahoma Bag & Cotton Mills Co.; $1,000,000; M. L. Berry, John T. Woodside and others interested; Weave, Bleach, Print and Finish Bags. 10,000 300

PENNSYLVANIA.

Chester. Clark, Robert E., Thread Co.; 126-28 E. 6th St.: $50,000; George Shober, pres.; Robt. E. Clark, treas.; C. H. Cressy, gen. mgr.; Sewing Threads and Spool Cotton, also Cones and Tubes. ....

Philadelphia. Indian Braid & Lace Works; Rosenau, Frankel & Co., props.; Indiana Ave. and A St.; Leo Silverman, supt.; Braids, Edgings and Laces for Underwear Trade. ....

Philadelphia. Rothwell, Charles; Umbria St. and P. R. R.; Manayunk; Turkish Towels. .. 3

Philadelphia. Wayne Mills Co.; Cope Mills, Wayne Junction; $25,000; Arthur S. Milnes, pres.; Thos. McNair, treas.; Narrow Fabrics. (S) ....

Tullytown. Barlow & Burns Elastic Webbing Co.; $25,000; Richard Barlow, pres. and agt.; T. P. Burns, treas.; Elastic Webbing. (S) 12

RHODE ISLAND.

Central Falls. Regina Lace Corp.; $200,000; Emil J. Ozanne, pres.; Harold C. Whitman, treas.; Laces; 40 machines. ....

Pawtucket. Cadoza Lace Co.; $400,000; Laces. ....

Pawtucket. Narragansett Narrow Fabric Co.; $100,000; L. W. Bishop, pres., treas. and buyer; Narrow Fabrics, Webbings, Hat Bands in Cotton and Silk. 30

Pawtucket. Nonpariel Mfg. Co.; $100,000; Philias Chartier, pres.; Noah E. Pion, treas., supt. and buyer; Glazed Yarns and Threads. (S) ....

Pawtucket. Seekonk Lace Co.; $150,000; Henry J. Lynd, pres.; John E. Judson, sec.; Louis Lescault, treas.; W. D. Sowter, supt.; Laces; dye. (E) (Addition under construction with capacity of 18 lace machines.) ....

Phenix. Phenix Braid Mill; $15,000; Clarence O. Carpenter, pres.; Herbert W. Barber, treas. and buyer; Shoe Laces and Braids; 7,000 braiding spindles. ....

Providence. Pioneer Lace Mfg. Co.; $75,000; Hugo Kanzler (N. Y.), pres.; Wm. H. Wettlaufer (N. Y.), treas.; Wm. Armour (Prov.), vice pres.; Laces. (Will locate at some point in R. I.) ....

Warwick. Phoenix Lace Mills; $275,000; Robt. Reoch (Phenix, R. I.), pres.; Walter F. Earle (Cambridge, Mass.), treas.; Laces, Edgings and Insertion; 12 machines. ....

Woonsocket. Nyanza Mills; $500,000; John W. Farwell, pres.; Nathaniel F. Ayer, treas.; E. F. Willey, agt.; 2/40s and Lower Mercerized Yarns. (E) .....25,000 ..

SOUTH CAROLINA.

Belton. E. B. R. Weave Shed; E. B. Rice, Jr., prop.; Turkish Towels and Doilies. (S & E) 10

Chesnee. Chesnee Mills; $400,000; W. E. Burnett (Spartanburg), pres. and treas.; J. N. Cudd (Spartanburg), vice pres. and mgr.; Fine Lawns. (E) (Under construction.)..25,000 460

Columbia. Glencoe Cotton Mill; $100,000; T. H. Wannamaker, pres., treas. and buyer; J. M. Enloe, supt.; Twines and Warps. (E) ..... 5,000 ..

Easley. Alice Cotton Mills; $300,000; E. H. Shanklin, pres. and treas.; E. E. Bishop, supt.; Sheetings and Drills. (E) 20,480 450

Great Falls. Republic Cotton Mills; $600,000; Robt. S. Mebane, pres.; Hal. B. Mebane, sec. and treas.; Deaver Little supt.; Print Cloths. (E) 25,200 650

Greenwood. Panola Cotton Mills; $250,000; F. S. Evans, pres. and treas.; W. Y. Harrison, supt.; Sheetings. 10,000 300

TENNESSEE.

Knoxville. Standard Knitting Mills; building yarn mill, 3 stories, 210 by 75 ft. .....13,000 ..

TEXAS.

Marble Falls. Marble Falls Cotton Mill Co.; $300,000; J. R. Yett, pres.; T. M. Dees, sec. and treas.; J. A. Smith, vice pres. and mgr.; Ginghams, Madras, etc. (E) 400

McKinney. Texas Cotton Mill Co.; $200,000; Perry Burrus, pres.; J. L. White, treas.; Cheviots and Chambrays; dye. (S & E).... 5,000 150

VERMONT.

Brattleboro. Fort Dummer Mills; $450,000; Edward G. Chace (Providence), mgr.; to build fine lawn mill. (E) 35,438 650

VIRGINIA.

Alta Vista. Alta Vista Cotton Mill Co.; $300,000; A. C. Hutchinson (Charlotte, N. C.), pres. and treas.; T. V. Elson, sec.; Lawns. (E) (Under construction.) 13,000 300

Norfolk. Southern Bagging Co.; Established Cotton Felt Mattress Plant; 4 garnetts; 4 pickers; 2 willows; 8 sewing machines. ....

NEW WOOLEN MILLS.

No. Sets & Width Cds | Looms

CANADA.

Ontario. Windsor. Burlington, Windsor Blanket Co.; $50,000; (G. C. Rasch and W. G. Rasch, Burlington Blanket Co., Burlington, Wis., interested); "Ventiplex" Fabric Sweat Pad. ....

CONNECTICUT.

Dayville. Glen Worsted Co.; W. K. Litch, supt.; succeeds to business of Glen Worsted Mills, Harrisville, R. I., whose plant was sold to Wolff Worsted Mills. 5 28

New Boston. Fabyan Woolen Co.; installing new machinery in old woolen mill preparatory to starting up. 5 80

Phoenixville. Phoenix Carpet Co.; James H. Walsh and Thos. P. Melleady, props.; Axminster Rugs; dye. (W) ....

Rockville. Rockville Worsted Co.; $162,500; Frank E. Weeden, pres.; Edmond Corcoran, treas.; T. J. Corcoran, Jr., supt.; Fancy Worsteds; dye and finish. (S) 80

Unionville. Broadbent, J. & Son; branch mill started on Knitting Yarns. ..... 2 ..

MASSACHUSETTS.

Lawrence. Pacific Mills; built new worsted mill, including yarn mill, 550 by 130 ft., 6 stories; weave shed, 560 by 150 ft., 1 story and basement. 1084

Lawrence. Uswoco Mills; $1,500,000; controlled by U. S. Worsted Co. (Under construction.) ....

Lawrence. Whitman, Wm. & Co.; worsted and Merino yarn mill (French system), under construction; 30,000 spindles. (Begin mfg. April, 1911.) ....

Lowell. Lowell Felt Co.; $25,000; W. D. Smith, pres.; Dwight Smith, treas. and buyer; E. R. Libby, supt.; Wool Felts and Wool Wadding; dye. (S & W) ....

Medway. Fabyan Woolen Co.; to start up old Sanford Mill; building dye house and making other changes. 5 70

Winchendon. Union Shoddy Mills; $10,000; Solomon Gould, treas.; Shoddy. ....

NEW JERSEY.

Passaic. Passaic Worsted Spinning Co.; $600,000; E. Ruckdeschel, pres.; Otto Bruckner, treas.; Alpha Garth, mgr.; new company to make Worsted Yarns (Bradford) for Gera Mills; 12 combs; 10,000 spindles. (Under construction.) .... ..

NEW YORK.

Amsterdam. McCleary, Wallin & Crouse; building new mill, 4 stories, 30 by 260 ft., to be equipped with 2,000 spindles, for making Carpet Yarns; also building new dye house, 2 stories, 50 by 100 ft. .....12 ..

Poughkeepsie. Jagger, Joseph; Wilton Rugs; experimental plant. 1
Salamanca. Ashworth, Abraham's Sons; Worsted Yarns. ....
Salamanca. Ashworth & Odell Worsted Co.; $125,000; Asa Ashworth, pres. and buyer; H. Louis Odell, sec. and treas.; 2/20 to 2/40 Worsted Yarns (Bradford); 4,000 spindles. ....

OHIO.

Cleveland. Cleveland Worsted Mills Co.; making extensions to power house with a view to erecting 10-story mill, 300 by 90 ft., for Carding, Combing, French Spinning and Dyeing. ....
Piqua. Orr Felt & Blanket Co.; started worsted mill; Men's Wear, Piece Dyes, etc.; 2 combs; 2,000 spindles (Bradford). 2 40
Ravenna. Standard Knitting Co., Inc. (Cleveland); Wool Knitting Yarns. ..... 4 ..

PENNSYLVANIA.

Erie. Tauber Woolen Mills, John; Wool Scouring, Carding, Etc., Batting and Comforts. ..... 5 ..
Philadelphia. Cansfield & Birnie— 2946 B St.; Men's Wear, Woolens and Worsteds. (E) 6
Philadelphia. Comet Spinning Mills; Thos. A. Taylor, prop.; Howard and Berks Sts.; John Haney, supt.; Woolen and Merino Yarns; 1,600 spindles. ..... 2 ..
Philadelphia. Dresden Carpet Co.; Richmond and Pacific Sts.; $30,000; Edwin C. Read, Jr., buyer; Wilton Rugs. 23
Philadelphia. Franklin Worsted Mills; 2706 N. Hancock St.; J. Turner, prop.; Worsted Men's Wear. 8
Philadelphia. Graham, Thos.; Bridesburg; All Wool Rugs. (S) 3
Philadelphia. International Rug Co.; 30th and Chestnut Sts.; $75,000; C. N. Fries, pres.; A. F. Gilmore, treas.; C. W. Toboldt, gen. mgr.; Import and Renovate Oriental Rugs; buy woolen yarns from Orient. ....
Philadelphia. Model Mills Co.; $250,000; Thos. Boggs, pres.; Louis G. Greene, sec. and mgr.; Geo. W. Boggs, treas.; built 5-story brick and concrete mill at Westmoreland and Kensington Ave.; installed 50 looms for Wilton Brussels and Ingrain Carpets and Rugs. (E) 50
Sharpsburg. Diamond Felt & Mfg. Co.; $30,000; John B. d'Homergue, pres. and buyer; John G. Wertz, treas.; Hair Felt. (S) ..... 2 ..

RHODE ISLAND.

Harrisville. Wolff Worsted Mill; $100,000; Zadock Wolff, pres.; Ernest W. Tinkham, treas., agt. and buyer; Robt. Dawson, supt.; Worsted Goods. (E) 56
Woonsocket. Samoset Worsted Mills; $300,000; Chas. L. Harding, pres.; E. S. Dunn, treas.; Walter Scott, agt.; Worsted Yarns (Bradford) up to 2/50; 10,000 spindles. (E) ....

WASHINGTON.

Washougal. Union Woolen Mills; $200,000 (authorized); Frank J. Bailey, pres. and treas.; Blankets. (S) 2 15

NEW KNITTING MILLS.

No. Ktg. Machines

CANADA.

Ontario. Brantford. Penman's Ltd. (Paris); building new 4-story mill at cost of $50,000. ....
Ontario. Georgetown. Keystone Knitting Co.; W. A. May, buyer; J. J. Fairbairn, supt.; Men's Sweater Coats; gasoline. 5
Ontario. St. Thomas. Monarch Knitting Co., Ltd. (Dunville); locating branch mill in St. Thomas.... ..
Ontario. Toronto. Crown Hosiery Co.; C. & A. G. Clark; Men's and Women's Cotton, Lisle and Cashmere Hosiery. (E) ....
Ontario. Welland. Chipman, Holton Knitting Co.; Hosiery; branch of Hamilton. ....

CONNECTICUT.

Hartford. Hartford Knitting Co.; John J. Campbell, pres., treas. and mgr.; Hosiery and Knit Goods. 12

GEORGIA.

Douglasville. Douglasville Knitting Mill; $15,000; J. T. Duncan, pres.; Half Hose. (S) 10
Rome. Cherokee Hosiery Mills; $30,000; E. F. Shropshire, pres.; F. C. Bivings, mgr.; Men's and Women's Hosiery. 75

ILLINOIS.

Chicago. Archer Knitting Works; 3013 Archer Ave.; Gloves, Mittens and Fancy Knit Goods. 9
Chicago. Klingknit Mill; Kling Bros. & Co., props.; 293 Fifth Ave.; Sweater Coats. 14

INDIANA.

Hammond. Hammond Knitting Co.; $10,000; Edward Friend, pres.; Fred Friedlander, treas.; Sweater Coats, Gloves and Mittens; employ 20..... ..
Richmond. Richmond Underwear Co.; $100,000; L. M. Flesh, E. A. Todd, H. E. Sims, Piqua, O., interested; Knit Underwear. ....

LOUISIANA.

New Orleans. National Hosiery Mills; $50,000; Erhard Mayer, pres., supt. and buyer; Albert Mayer, treas.; Men's and Women's Hosiery. (E) 18

MASSACHUSETTS.

Fall River. Marble Quality Mfg. Co.; C. E. Marble, pres. and treas.; H. L. McGettigen, sec.; Knit Goods. ....
Florence. Northampton Silk Co.; $250,000; Silk Hosiery. (Controlled by McCallum Hosiery Co., Northampton.) 50
Methuen. Jersey Knitting Co.; $10,000; A. N. Gilson, treas. and mgr.; Stockinette and Jersey Cloth. (E) 8
New Bedford. Mishaum Knitting Mill; Geo. C. Hatch, Jr., prop.; Half Hose. (S) 4
Stoughton. Harris, Gilbert; Mercerized and Silk Hosiery. 4

MICHIGAN.

Burr Oak. Whitehouse Underwear Mills; $10,000; Robt. B. Ferris, pres.; A. I. Whitehouse, treas. and buyer; Ribbed Wool Underwear and Sweaters. (E) 12
Chesaning. Big Rock Knitting Co.; $15,000; A. D. Chapman, pres.; F. A. Greenfelder, treas.; Sweater Coats, Shawls and Mufflers. 20
Detroit. Ernest Kirchler Knitting Mills; 474 Gratiot Ave.; Men's, Women's and Children's Coat Sweaters. (E) 11

NEW HAMPSHIRE.

Laconia. Stewart & Lowe; Men's and Women's Hosiery. ....

NEW JERSEY.

Atco. Leslie, Chas. L.; Men's and Women's Hosiery. (S) 3
Newark. Rivoli Silk Hosiery Co.; $10,000; A. Gutman, pres.; Leo B. Gutman, treas.; D. L. Gutman, supt.; Full Fashioned Hosiery. (S) ....
New Brunswick. Dakin, John E.; Silk Half Hose; dye and finish. 3
Paterson. Huettig, Hugo, Co.; $100,000; Hall Mill; Full Fashioned Silk Hosiery. ....

NEW YORK.

Albany. Albany Knitting Co.; $20,000; I. Milstein, pres.; B. Silverman, treas.; Sweater Coats, Gloves and Novelties. 60
Brooklyn. Rottenberg, Samuel; building 5-story mill, 85 by 100 ft. (E) 2/11 76
Brooklyn. Shapiro, B.; 103 Throop Ave.; Sweaters, Bathing Suits and Other Knitted Goods. ....
Buffalo. Western New York Knitting Co.; 32 B St.; $8,000; Richard E. Holzhey, pres. and mgr.; Herman Kramer, treas.; Knitted Coats and Fancy Knit Goods. (E) 4
Dalton. Keshequaw Knitting Co.; W. D. Burt, pres.; A. T. Esiaman, treas., supt. and buyer; Men's Half Hose. (S) 6
Falconer. Chautauqua Knitting Mills; A. E. Williams and P. A. Barrett, props.; Hosiery and Knit Webbing. 4
Fulton. Spanswick, Wm. H., Mfg. Co.; $40,000; W. H. Spanswick, pres. and mgr.; F. E. Fairchild, supt.; C. A. Larned, treas.; Children's Underwear. (E) 30
Milton. Hoag, C. F., Co.; $100,000; C. F. Hoag, pres.; Asa Hoag, treas.; Knitted Gloves. (E) (Branch of Poughkeepsie.) 40

Newport. Newport Textile Co.; Geo. B. Allen, pres.; John E. McLoughlin, treas.; Walter Eberley, supt.; Men's and Boys' Knit Goods. (E) (Branch of La Tosca Knitting Co., Utica.) 65

Utica. Frisbie & Stansfield Knitting Co.; Richelieu Dept., No. 2; Henry Niermeyer, supt.; Women's Union Suits; finish (S) 50

Utica. Imperial Textile Co.; $15,000; A. F. Spitzil, pres. and buyer; Henry M. Love, treas.; W. F. Warner, supt.; Infants' Wrappers and Bands. (E) (Enlarging.) 21

Utica. Supreme Underwear Mills; $25,000; A. E. Snyder, pres.; Wm. A. Clark, sec. and treas.; Albert G. Neel, supt.; Infants' Goods in Cotton, Merino, Silk and Worsted. (E) 11

Utica. Walnott Knitting Co.; $20,000; M. A. Wald, pres.; John J. Sinnott, treas.; John E. Crotty, supt. and buyer; Infants' Vests. 10

NORTH CAROLINA.

Cooleemee. North Cooleemee Hosiery Co.; $25,000; C. P. Readman, pres.; J. M. Greenfield, sec. and treas.; Cotton Half Hose. 24

Drexel. Huffman & Mull; Men's and Women's Hosiery. (E) 25

Durham. Durham Textile Mills; $50,000; Dr. A. M. Moore, pres.; C. C. Spaulding, treas.; Chas. C. Amey, supt. and buyer; Half Hose. 20

Henderson. Allgood, A. C.; Women's Hosiery. (E) 12

Hickory. Elliott Knitting Mills; $3,000; J. D. Elliott, pres.; E. Lyerly, treas.; Infants' Hosiery; dye. (S) 24

Robersonville. Robersonville Hosiery & Mfg. Co.; $20,000; J. H. Roberson, interested; Hosiery. .....

Sanford. Effie Hosiery Mills; W. A. Ellington, prop.; Cotton Half Hose. (E) 93

Wake Forest. Watkins Hosiery Co.; G. T. Watkins, mgr.; Men's Half Hose; gasoline. 12

OHIO.

Cleveland. Mandel, A. J. & Co.; 1388 W. 6th St.; Sweater Coats and Fancy Knit Goods. 12

Cleveland. Weisenberg-Guggenheim Co., 224 High St.; $10,000; Herman Guggenheim, pres.; Edw. J. Weisenberg, treas.; Knitted Neckwear. 12

Dayton. National Knitting Works Co.; $50,000; J. H. Goldberg, pres. and treas.; D. W. Johannesberg, sec.; Sweater Coats and Fancy Knit Goods. .....

OKLAHOMA.

Frederick. Frederick Knitting Mills; $100,000; J. W. Blackwelder, pres.; B. B. Blackwelder, treas.; Men's, Women's and Children's Hosiery. .....

PENNSYLVANIA.

Allentown. Sorosis Silk Co.; $25,000; Joseph S. Mack, pres.; Charles J. Ross, treas.; Geo. C. Halk, supt. and buyer; Silk Seamless Half Hose. (E) 20

Blandon. Maidencreek Hosiery Co.; Hosiery. (Branch of Temple, Pa.) .....

Boyertown. United Underwear Mills; D. H. Hartman, prop.; Samuel R. Knouse, supt. and buyer; Children's Underwear. 7

Dorrancetown. Birth & Weston Knitting Mills; S. H. Weston, buyer; Cotton Half Hose. (E) 16

Dover. Dover Hosiery Mill; D. S. Brillhart, prop.; Men's Seamless Half Hose. 15

Doylestown. Apollo Knitting Co.; T. W. & R. R. Tustin, props.; Knitted Silk Neckties. .....

Easton. Easton Knitting Mills Co.; $10,000; A. J. Bowers, pres.; Bast Reading, treas.; Paul Kaffke, sec. and mgr.; Harvey Shantz, supt.; Men's, Women's and Infants' Hosiery. (S & E) 74

Easton. Keiper & Keller; 1415 Spruce St.; Ladies' Swiss Ribbed Vests; finish. (E) 5

Fleetwood. Ritter Hosiery Co.; Frank Ritter, pres. and gen. mgr.; Cotton Seamless Half Hose; finish. (S) 16

Hamburg. Gotham Underwear & Bleach Works, No. 2; S. D. Bausher, prop.; Larue Miller, supt.; Women's Robbed Underwear; bleach; finish. (S) 16

Hawley. Wood, M.; Fancy Knit Goods. (E) 20

Hazleton. Hazleton Hosiery Co.; $35,000; W. H. Davies, pres.; T. A. Williams, treas.; Hosiery. (E) .....

Landingville. Landing Knitting Co.; A. D. Warmkessel, pres.; C. A. Warmkessel, treas.; Women's Underwear. (S) 8

Lebanon. Deeks, H. K.; Men's and Women's Hosiery. 10

Manchester. Manchester Hosiery Mills; P. J. Hillker, treas.; C. H. Markley, supt. and buyer; Women's Hosiery; gasoline. 10

Martins Creek. Clarke Knitting Co., Inc.; $10,000; Walter H. Clarke, pres.; H. E. Clarke, gen. mgr.; Women's and Children's Cotton Underwear; finish. (E) 14

New Berlin. Lesher, L. & Sons; L. Lesher, pres., treas. and buyer; Men's and Women's hosiery. (W) 40

Philadelphia. Atlas Knit Goods Co.; Wm. Gilbert, prop.; office, 518 Walnut Lane, Germantown; Sweater Coats. 6

Philadelphia. Bridesburg Hosiery Mills Co.; Edgemont and Kirkbride Sts., Bridesburg; $5,000; Chas. Stark, pres. and supt.; Chas. Rose, treas.; Mercerized and Plain Gauze Hosiery. 20

Philadelphia. Campbell, A. Wilson; 1102 W. Columbia Ave.; Seamless Hosiery. 19

Philadelphia. Eclipse Knitting Mill; 520 Commerce St.; L. M. Rosen, mgr. and buyer; Sweater Coats. (E) 12

Philadelphia. Greenpoint Knitting Mills; J. Bloom & M. Rosenblatt, props.; 1019 N. 2d St.; Sweater Coats. 4

Philadelphia. Haines Hosiery Mill; Bristol St., above Germantown Ave.; Joseph Haines, Jr., buyer; Silk Hosiery. 4

Philadelphia. Heller & Heller; 136 N. 3d St.; Sweater Coats. 5

Philadelphia. Ideal Knitting Mills; Max Cohen, prop.; 16 S. 3d St.; Sweater Coats. (E) 8

Philadelphia. Metz, H. A.; 125 N. 3d St.; Fancy Knit and Crochet Goods. .....

Philadelphia. Mindru Hosiery Mills; Marshall St. and Hunting Park Ave.; $100,000; Full Fashioned Hosiery. .....

Philadelphia. Puritan Knitting Mills; Samuel Titelman and Nathan Neuman, props.; 5th and Chestnut Sts.; Coat Sweaters. 19

Philadelphia. Quaker City Mills; 13th and Hamilton Sts.; Sweater Coats. .....

Philadelphia. Regal Hosiery Co.; Willard St., east of Kensington Ave.; Silk Hosiery; dye and finish. (S) 28

Philadelphia. Richter, Harry; 26 N. 3d St.; Sweater Coats. (E) 4

Philadelphia. Riehms Knitting Co.; Adams Ave. and Unity Sts., Frankford; $10,000; Sweater Coats. .....

Philadelphia. Roxford Knitting Co.; increased capital from $250,000 to $450,000; building new 7-story mill, 140 by 76 ft. 300

Philadelphia. Smith, William; 243 E. Ontario St.; Sweater Coats and Fancy Knit Goods. (E) 5

Philadelphia. Taubel, William F.; Coral and Adams Sts.; Mercerized Half Hose. (Branch of Riverside, N. J.) 200

Philadelphia. Thudium, Wm. G., Hosiery Co.; Mascher and Turner Sts.; Women's Seamless Hosiery. 45

Philadelphia. Union Knitting Mills of Pa.; 17 S. 4th St.; $10,000; David Frankil, pres.; Max Hertzberg, treas.; Nathan Binder, supt. and buyer; Sweater Coats; finish. (E) 18

Philadelphia. Universal Hosiery Co.; Second, Norris and Philip Sts.; $100,000; Morris Bernheimer, pres.; Wm. Schoenherr, sec. and gen. mgr.; Ladies' Silk Lisle and Silk Full Fashion and Children's Ribbed Full Fashion Hosiery; finish. (S) .....

Philadelphia. World Knitting Co.; 26 N. 3d St.; Sweater Coats and Bathing Suits; finish. .....

Pottstown. Arion Knitting Co.; Walter S. Weber, mgr. and buyer; Men's, Women's and Children's Seamless Hosiery. 94

Reading. Berks Knitting Co.; $50,000; O. B. Wetherhold, pres.; W. R. Wetherhold, treas. and buyer; Cotton and Silk Hosiery. (S) 50

Reading. Oakbrook Hosiery Co. (Oakbrook); Isaac Eberly, pres. and supt.; Wm. G. Leininger, treas.; Women's 200-needle hosiery. (S) 28

Reading. Ruby, Edwin, Co.; E. C. Ruby, pres.; C. F. Schultz, treas. and buyer; "Save Hose," a Stocking Protector. .....

Reading. Wolfinger, Albert W.; Front and Washington Sts.; Arthur Booth, supt.; Men's and Women's Hosiery. (S) 109

Shamokin. Shamokin Knitting Mills; $10,000; Irvin S. Malick, pres. and supt.; M. Elmer Malick, treas. and buyer; Hosiery. (S) 20

Shoemakersville. Burkey Bros.; Cotton Underwear. .....

South Bethlehem. Alacrity Knitting Mill Co.; $15,000; John C. Smith, pres., mgr. and buyer; Wm. Sinwell, treas.; Silk and Mercerized Half Hose (S) 20

South Bethlehem. Monarch Knitting Co.; $5,000; P. E. Kressly, pres., treas. and buyer; Women's and Misses' Ribbed Underwear. (S) 5
Strausstown. Herbein & Anthony; Harry W. Anthony, supt.; Men's Half Hose. (S) 23
Tamaqua. Warner & Loop; H. L. Loop, buyer; Women's and Misses' Underwear; finish. 6
Tatamy. Gold-Wiley Hosiery Co., Inc.; $70,000; Miller R. Wiley, pres.; David Balp, treas.; Harry Carter, supt.; Men's and Women's Hosiery. (S) (To build knitting, dyeing and finishing plant at Easton in spring, 1911.) 70
West Lawn. West Lawn Underwear Co.; (P. O. R. F. D. No. 1, Sinking Springs); Geo. W. Bickel, supt. and buyer; Women's Swiss Ribbed Vests. (S) 4
Wilkesbarre. Marshall, W. S. & Co.; W. S. Marshall, pres. and supt.; L. I. Hohl, treas. and buyer; Men's and Women's Hosiery. (S) 16
Wind Gap. Wind Gap Knitting Co., Inc.; $5,000; John T. Bower, pres.; Wm. H. Rahn, treas.; Edw. F. Wentworth, gen. mgr. and buyer; Women's and Misses' Underwear; bleach and finish. (E).. 6
York. Elmerbrink Hosiery Co.; W. J. Driven, supt.; Cotton Half Hose. ..

RHODE ISLAND.

Woonsocket. Hope Knitting Co.; Wm. A. Tucker, treas., mgr. and buyer; Burton La Fleur, supt.; Coat Sweaters. (E) 5

TENNESSEE.

Knoxville. Appalachian Mills; $50,000; M. D. Arnold, pres.; R. N. Lotspeich, treas.; M. G. Thomas, mgr. and buyer; Men's Ribbed Underwear; finish. (E) 20
Maryville. Maryville Hosiery Mills; $50,000; R. D. Oliver, pres. and buyer; C. S. Greene, supt.; Men's, Women's and Misses' Hosiery; dye; finish (E) (Rebuilt burned plant of old Maryville Hosiery Mills, purchased equipment of Watauga Hosiery Mill of Johnson City, and installed new machinery.) 100

VIRGINIA.

Norfolk. Knitting Mills Corporation; $25,000; Garland P. Peed, pres.; H. R. Furr, treas.; Women's Ribbed Underwear. (E) 29
Norfolk. Northside Knitting Mills; $50,000; Thos. H. Haynor, pres.; D. Tillar I'Anson, sec. and treas.; L. B. Cochrane, supt.; Men's and Women's Underwear. ..
Suffolk. Maxwell Hosiery Mills, Inc.; $10,000; M. Maxwell, pres.; H. E. Maxwell, sec. and treas.; C. H. Pate, supt.; Women's and Children's Seamless Hosiery. (E) 25

WASHINGTON.

Centralia. Guenthers Knitting Co.; $12,000; Hosiery. ..
Centralia. Seney Knitting Co.; Sweaters, Cardigans, Wool Hosiery, etc.; A. W. Seney, interested. ..

WISCONSIN.

Appleton. Imperial Knitting Works; H. F. Bach, prop.; Sweater Coats. 5
Mauston. Portage Hosiery Co. (Portage, Wis.); established branch mill in Mauston; J. M. Stickler, supt.; Wool Yarns, Hosiery and Knit Goods. ..
Milwaukee. Good Hosiery Mills; $10,000; Jos. W. Koeberle, pres.; Wm. A. Elfers, treas.; Women's Hosiery. (E) 10
Two Rivers. Friedlander, M., Knitting Co.; (branch of Milwaukee); Mittens and Gloves. (E) 50

NEW SILK MILLS.

Looms

CALIFORNIA.

San Diego. California Silk Mills, Inc.; 5th Ave. and Elm St.; $100,000; Wm. H. Hibbard, pres.; J. W. Hibbard, treas.; Wm. Hilton, supt.; Broad Silks, Handkerchiefs, Ties and Silk Specialties... 15

CONNECTICUT.

South Manchester. Cheney Bros. erected new mill, 2 and 3 stories high, 100 by 425 ft.; special machinery for making spun silk yarns; also equipped the Trotter Mill with 70 looms and operate it under the name of the Bigelow Mill. ..

MASSACHUSETTS.

Holyoke. Donoghue Silk Mfg. Co.; F. J. Donoghue, treas.; David Goetz, supt.; Silks and Satins. ..

NEW JERSEY.

Alpha. Alpha Silk Co.; $50,000; building mill, 55 by 150 ft., for manufacture of Silk Threads. (Controlled by John Ramsay & Sons, Phillipsburg...) ..
East Rutherford. Georgian Plush Mills; Geo. Schmiedel; Silk and Cotton Plush. (D) 10
Passaic. Dundee Silk Throwing Co.; $25,000; Samuel Birnbaum, pres., treas., supt. and buyer; Silk Yarns; 7,000 spindles. (W & S) ..
Paterson. Acme Silk Co.; Strange Mill; Broad Silks. 30
Paterson. Hicks, Frank L.; 537 Tatowa Ave.; Fancies, Neckwear Silks and Specialties. 30
Paterson. King Silk Co.; 93 River St.; A. Goldberg and H. Jacobs; Broad Silks. 10
Paterson. Knickerbocker Silk Co.; Hall Mill; $50,000; E. Friedman, mgr.; Ribbons. 30
Paterson. Newark Silk Co.; Joseph Fortinsky, prop.; Sowerbut Mill; Broad Silks. 20
Paterson. Novelty Silk Co.; E. 18th St., cor. Governor St.; $50,000; Broad Silks. 20
Paterson. Oppenheimer & Levy; Getty Ave. and George St.; Laces. ..
Paterson. Salzberg, A. & C.; 93 River St.; Broad Silks. 10
Paterson. Vilek, E.; 93 River St.; Broad Silks. 12
Paterson. Wechsler-Barber Silk Co.; Reinhardt Mill, Clay St.; $15,000; Ernest Barber, pres.; Daniel Wechsler, treas.; Broad Silks. ..
Plainfield. Somerset Mills; $100,000; Silks. ..

NEW YORK.

Waverly. Waverly Silk Ribbon Co.; $30,000; Silk Ribbons. 33

PENNSYLVANIA.

Allentown. Doherty & Wadsworth Co.; Broad Silks. (Branch of Paterson, N. J.) 50
Allentown. Fairview Silk Co.; $10,000; Gustav Laurent, pres.; Henry Jordan, M. D., treas.; Hat Bands, Ribbons and Shoe Laces. (E) 7
Allentown. Keystone Textile Co. (So. Allentown); Chas. W. Gossert, treas.; Broad Silks; also purchased plant of Astron Silk Co., Allentown; plants operated separately for present. 100
Forest City. Klots Throwing Co.; Commission Throwing; (S & E); 2,000 spindles. ..
Juniata. Schwarzenbach Huber Co., The; R. F. J. Schwarzenbach, pres.; Robt. Brupbacher (Altoona), supt.; Broad Silks. (Under construction.) 500
Lehighton. Lehighton Ribbon Co.; Peter Campbell, prop.; Ribbons and Hat Bands. (E) (To be incorporated.) 7
Marcus Hook. American Viscose Co.; Artificial Silk. (Under construction.) ..
Mt. Carmel. Mt. Carmel Silk Mfg. Co.; $25,000; W. H. Shindel, treas.; E. E. Ellwood, mgr. and buyer; Broad Silks. (E) 50
Northampton. Meyer, John H., Silk Mfg. Co.; (John H. Meyer Co., 77 Worth St., N. Y.); building 400-loom plant, to be completed Jan., 1911..... 400
Peckville. Peck, F. A. & W. H. Kilgour; silk throwing plant under construction; 1/1/11. ..
Royersford. Royersford Embroidery Co.; J. M. Lewin; Embroidery. (E) ..
South Bethlehem. Wyandotte Silk Co.; $50,000; Kenneth Wilbur, pres.; Herman Seltman, vice pres. and mgr.; Robt. E. Wilbur, treas.; Commission Throwing; 8,000 spindles; electric. (Mill at Northampton Heights.) ..
Stroudsburg. Stroudsburg Ribbon Mills; $30,000; Frank W. Kimmerle, pres. and supt.; Jacob F. Levy (N. Y.), sec. and treas.; Ribbons; dye and finish. (S & W) 60
Walnutport. Evans, N. C., Co.; $5,000; S. S. Coffin, pres. and treas.; N. C. Evans, supt. and buyer; Broad silks. (S) 13
York. Levy, E. & H. (New York); to build ribbon mill and move machinery from New York City. ..

RHODE ISLAND.

Westerly. Washburn, H. K. & W. A.; W. A. Washburn, supt.; Silk Throwing. (Branch of So. Coventry, Conn.) ..

MISCELLANEOUS NEW MILLS.

CONNECTICUT.

New London. Thames Dyeing & Bleaching Co.; $30,000; A. J. Perry, pres.; T. G. Haney, treas. and mgr.; Dye and Bleach Raw Stock. (S) (Mill at Bartlett's Switch.)

ILLINOIS.

Chicago. Boynton Wool Scouring Co.; built new mill at 3601 Iron St. and removed to new location.

Chicago. Strauss, Fred, Dye Works; 2649-59 Sheffield Ave.; Dye and Bleach Wool, Cotton, Silk Piece Goods, etc.

IOWA.

Davenport. De Luxe Textile Co.; $25,000; Arthur Clifford, pres.; Frank Kroeger, treas.; Alfred Clifford, supt.; Laces. (D) (E)

MASSACHUSETTS.

Chelsea. Conduit & Cable Mfg. Co., The; Highland and Suffolk Sts.; J. H. Parker, pres.; J. S. Wilson, vice pres.; W. H. Tyler, treas.; Conduits and Coverings for Cables.

Gardner. Eastbrook Co., The; $300,000; G. L. Forest, pres. and agt.; M. M. Whittemore, treas.; B. C. Mudge (Oxford Linen Mills, No. Oxford), managing director; "Oxowool." (S)

Lawrence. Pacific Mills; building new print works; purchased print works dept. of Hamilton Mfg. Co., Lowell; new print works include printing building, 720 by 85 ft.; dye house, 994 by 251 ft.; finishing building, 900 by 90 ft.; power station, 330 by 85 ft., and coal pocket.

Mansfield. Mansfield Bleachery; $100,000; Patrick Bannon, pres.; Wm. H. Bannon, treas. and supt.; Bleach and Finish Fine Cotton Piece Goods, capacity 50,000 yds. per day. (S)

MINNESOTA.

Winthrop. Winthrop Cordage Co.; $50,000; Alvin T. Johnson, pres.; J. A. Lawson, treas.; Flax Twine and By-products; 120 spindles. (S)

NEW JERSEY.

Bloomfield. American Flax Fiber Co., Inc.; $100,000; E. Kingsland Sargeant, Jr., pres.; Joseph Stretch, treas.; P. Kingsland Sargeant, supt.; Prepared Flax and Linen Yarns; 8s to 20s. (S & W)

Hohokus. Spring Brook Bleaching & Finishing Co.; $75,000; John L. Vansant, pres. and supt.; James G. Gregg, treas.; R. S. M. Boyce, sec.; Bleach and Finish Cotton Cloth. (S)

Jersey City. Bonte Cordage Works; $10,000; Geo. H. Bonte, pres.; A. L. Regan, supt.; Jute Twine Specialties and Packings. (E)

Newark. Kaltenbach & Stephens; erecting finishing plant for mills at Brooklyn and Allentown, Pa. (E) (Under construction.)

Passaic. Passaic Ribbon Printing Co.; Thos. Foxhall, Jr., supt. and buyer; Printing Ribbon Warps, Ribbons and All Narrow Goods. (S)

Paterson. Barbour, J. E.; Lakeview; Linen Thread and Yarns; dye. (Under construction.)

Somerville. De Witte Dyeing & Bleaching Works; Emil A. De Witte, prop.; Dye and Bleach Woolen, Worsted and Cotton Yarns.

Wharton. American Flax Fibre Co., Inc.; Lakemont Mills; Linen Towels, Yarns and Prepared Flax. (S & W)

NEW YORK.

Brooklyn. Parsons Dyeing & Cleaning Co.; Huntington Dye Works; Nathan G. Parsons, buyer; Dye Braids, Webbings and Millinery Goods.

Lockport. Flaxen Fibre Down Co.; $25,000; J. Sidney Starling, pres. and mgr.; C. W. Parsons, sec. and treas.; Linen Products.

New York. Renke Swiss Lace Works; $15,000; Geo. T. Renke, pres. and supt.; William Corsa, treas.; Dye and Refinish Textile Fabrics.

Troy. Cluett, Peabody & Co.; Bleach and Finish Cotton Goods; mill on Peebles Island.

NORTH CAROLINA.

Burlington. Keystone Dye & Finishing Mill, Inc.; $125,000; J. W. Murray, pres.; J. M. Browning, treas., mgr. and buyer; Dye and Finish Knit Goods. (S)

PENNSYLVANIA.

Philadelphia. Janero Dye Works; Auguste Friedrichs, Jr., prop.; Third and Huntingdon Sts.; Dye and Print Tops. (S)

Philadelphia. Megowan, Thos.; Adams and Church Sts., Frankford; Coning, Winding and Quilling of Yarns. (S)

Philadelphia. National Asbestos Co.; Lena and Armat Sts.; Asbestos Cloth; 2 looms. (S)

Philadelphia. Phoenix Dye Works; Ernest Muller, prop.; Clearfield and Witte Sts.; Dye, Print and Finish Hosiery. (S)

Philadelphia. Preston, Joseph; 5326 James St., Bridesburg; Linen Huck Towels; 6 looms; steam.

Philadelphia. San-Knit-Ary Bleachery, Inc.; 2622 N. Front St.; $25,000; Simon Friedberger, pres.; Thos. E. Ashdale, supt.; Dye and Bleach Knit Goods, Toweling, Yarns, etc. (S)

RHODE ISLAND.

Pawtucket. Pawtucket Lace Finishing Co.; $100,000; Joseph D. Gendron, pres.; Joseph D. Brassard, sec. and treas.; Gustave J. Testut, supt.; Lace Finishing; dye. (E)

Projected Industries.

Under this head are enumerated such projects as are now in course of construction, or which in all probability soon will be, but are not sufficiently far advanced to be properly identified in the list of new mills.

COTTON.

GEORGIA.

LaGrange. Dunson Mills; $250,000; L. E. Dunson, pres.; W. S. Dunson, treas. and supt.

West Point. Reed Cotton Mill; $500,000; E. B. Reed (Columbus), and West Point capitalists interested.

MAINE.

Saco. York Mfg. Co.; bought 1,000 acres of land, some of which is to be used for manufacturing purposes; no plans made.

MASSACHUSETTS.

New Bedford. Luce, Chas. T.; organizing company to make fine and medium fancy cotton goods; 50,000 spindles; 1,200 looms. (S)

Rockland. Emerson Fabric Co.; $50,000; Chas. O. Emerson, treas.; to make linings for clothing and footwear.

NORTH CAROLINA.

Ansonville. Richardson, A. H.; plans power development on Rocky River and $1,000,000 cotton mill.

Charlotte. Robbins, O. A.; architect and engineer; interested in establishing $400,000 fine goods mill in Piedmont section.

Mocksville. White, Fred H. (Charlotte, N. C.); interested in organization of $225,000 cotton mill company.

Newell. Newell Cotton Mill; $300,000; A. C. Hutchinson (Charlotte), sec. and treas.; Fine Cotton Goods; 12,500 spindles; 300 looms. (E)

North Wilkesboro. Finwin Cotton Mill Co.; J. L. Erwin, pres.; T. B. Finley, vice pres.; J. S. Vincent, sec. and treas.; Cotton Yarns.

SOUTH CAROLINA.

Abbeville. Long Cane Mills; $200,000; J. Allen Smith, pres.; Cotton Goods.

Florence. Florence Mfg. Co.; $200,000; J. Willard Ragsdale, pres. and treas.; Cotton Cloths; 10,000 spindles; 300 looms.

Greenville. Fine Lawn Mill; $700,000; J. I. Westervelt and New England machinery concerns interested.
Laurens. Connemara Cotton Mills Co.; $400,000; J. Adger Smyth, Jr., pres.; Thos. I. Swygert, sec. and asst. treas.; Sheetings; 20,000 spindles; 500 looms.
Newberry. Oakland Cotton Mills; $400,000; W. H. Hunt, pres.; John M. Kinard, vice-pres.; E. N. Martin, sec.; Sheetings; 20,000 spindles; 500 looms. (E)
Prosperity. Prosperity Cotton Mill; $200,000; Dr. J. S. Wheeler, pres.; Geo. Y. Hunter and W. W. Wheeler, interested; Sheetings; 10,000 spindles; 300 looms.
Union. Flynn, D. C.; interested in organizing $500,000 cotton mill.

TENNESSEE.

Erwin. Heath, O. P. & Co. (Charlotte, N. C.); interested in establishing cotton mill at Erwin.

WOOLEN.

MASSACHUSETTS.

Worcester. Rome. Feigensen Co.; Hyman J. Rome, treas.; propose to manufacture woolen goods.

OHIO.

Cleveland. Eureka Worsted Mills Co.; $100,000; Wm. S. Thorpe, pres.; M. G. Corbley, vice pres.; M. J. Flannagan, sec. and treas.; worsted yarns (Bradford).

KNIT.

MICHIGAN.

Grand Rapids. Clements, E. A., and others planning new knitting mill, capital $100,000.

NEW YORK.

Oswego. Shufelt, James A.; proposes to establish $40,000 plant for making men's union suits.

OHIO.

Ashtabula. Boll, E. A., Mentor, O.; interested in starting knit underwear mill.
Cincinnati. Goldsmith's, P., Sons; 207-11 W. Pearl St.; manufacturers of sporting goods; plan to establish plant for knitting base ball stockings.

PENNSYLVANIA.

Easton. Gold-Wiley Hosiery Co., Inc.; Tatamy, Pa.; propose to build knitting, dyeing and finishing mill at Easton in spring, 1911.
Red Lion. Lion Knitting Mills; George Stewart, J. S. Heiges, Livingston Jones, interested.

SOUTH CAROLINA.

Aiken. Carolina Mfg. Co.; $10,000; Hosiery. (E) W. H. Hite interested.

TEXAS.

Sweetwater. Baumgartner, B.; interested in establishing a knitting plant.

SILK.

CONNECTICUT.

Norwich. Giron Bros. & Co. (St. Etienne, France); propose to establish velvet ribbon plant.
Willimantic. Rossie Velvet Co. (Mystic, Conn.); plans to establish branch mill.

NORTH CAROLINA.

Southmont. Singleton Silk Mfg. Co. (Dover, N. J.); silk throwing.

PENNSYLVANIA.

Wilkesbarre. Century Throwing Co. (Paterson, N. J.); plans to build branch mill in Wilkesbarre.

MISCELLANEOUS.

LOUISIANA.

New Orleans. Zapupe Silk Fibre Co.; $1,000,000; C. W. Elrod, agt.; Silk Underwear, Hosiery, Dress Goods, etc.; dye.

MINNESOTA.

Winona. Oxford Linen Mattress Co.; $600,000; Linen Mattresses; Oxford Linen Mills, North Brookfield, Mass., interested.

NEW YORK.

Troy. Troy Bleaching, Dyeing & Finishing Co.; $300,000; Bleach and Finish Cotton Piece Goods.

Important Changes.

COTTON.

ALABAMA.

Eufaula. Glenola Cotton Mills Co.; $50,000; new company organized by Dickson & Hull, New York, to take over Barbour Cotton Mills.
Selma. Valley Creek Mills; $150,000; L. E. Jeffries, pres.; Wm. R. Meadows, treas., mgr. and buyer; bought plant of Estelle Cotton Mills.

GEORGIA.

Berryton. Berryton Mills; $150,000; Jno. M. Berry, pres.; H. R. Berry, treas.; C. H. Land, supt.; Hosiery Yarns and Misses' Hosiery; taken over plant of Raccoon Mfg. Co. and changed name of town from Raccoon Mills to Berryton.

LOUISIANA.

New ..Orleans. Lane Cotton Mills Co.; $900,000; S. Odenheimer, pres.; H. T. Howard, sec. and treas.; new corporation taken over and operating Lane Mills of Textile Mills Corp. on Denims, etc.; installing new looms.

MASSACHUSETTS.

Brockton. Lincoln Webbing Co.; $25,000; Arthur W. Smith, pres.; Geo. G. Allen, treas.; new corporation succeeds Arthur W. Smith & Co., shoe webbing manufacturers; enlargement constructed and equipment increased.
Fitchburg. Martin, T. & Bro. Mfg. Co. (Chelsea); bought plant of Houghton Web Co., and operate it as Dept. F of their business.
North Adams. Hoosac Cotton Mills; $1,500,000; Wm. M. Butler, pres.; Robert W. Prentice, treas.; N. B. Kerr, agt.; Wm. K. Greer, supt.; combines Eclipse Mill and Beaver Mill of Arnold Print Works, purchased by new corporation.
Williamstown. Greylock Mills (North Adams); purchased Williamstown Mill of Arnold Print Works; improving and will operate as branch of North Adams plant.

MISSISSIPPI.

McComb. Delta Cotton Mills, Inc.; Frost Torrence, pres.; John C. Rankin, vice-pres.; W. W. Glenn, sec. and treas.; succeeds McComb City Cotton Mills.

NEW JERSEY.

Egg Harbor City. Harbor Mills Co.; new name of National Cotton Tuft & Fibre Co.; plant removed from Philadelphia.

NEW YORK.

Capron. Sauquoit Spinning Co.; $600,000; W. J. Frisbie, pres.; Geo. A. Frisbie, treas.; W. H. Merriam, supt. and buyer; Combed and Carded Yarns, 12s to 45s; taken over and improved plant of Utica Cotton Co.
Lestershire. Lestershire Towel Mills; succeeded Corliss Towel Mills.
Stuyvesant Falls. Frisbie Mfg. Co.; $25,000; Chas. Frisbie, pres.; A. V. A. Frisbie, treas. and buyer; Print Cloths; succeeded Langdon Mfg. Co. in operating Van Alen Cotton Mills.

NORTH CAROLINA.

Concord. Brander Cotton Mills Corp.; $85,000; L. W. Brander, pres.; B. A. Ruffin, treas.; new corporation succeeding Hanover Mfg. Co., bought plant.
Concord. Roberta Mfg. Co.; $100,000; John C. Rankin, pres.; E. F. White, treas.; P. M. Keller, supt.; Cotton Yarns; succeeded Dowell Mfg. Co
King's Mountain. Phoenix Mfg. Co.; $200,000; J. C. Plonk, pres.; R. F. Roberts, sec. and treas.; Cotton Yarns; taken over plant of Lula Mfg. Co.

King's Mountain. Sevier Cotton Mills Co.; $60,000; Lawrence S. Holt, pres.; Robert L. Tate, treas. and buyer; Cotton Yarns; reorganization of John Mfg. Co.

Lincolnton. Daniel Mfg. Co.; bought by D. E. Rhyne and name changed to Rhyne's Cotton Mill.

Mountain Island. Armon Mfg. Co.; $150,000; C. E. Hutchison, pres. and treas.; R. F. Craig, mgr.; succeeds Knox Net & Twine Co.

Spray. Marshall Field & Co. (Chicago); acquires control of American Warehouse Co., Lily Mills, Rhode Island Co., Spray Woolen Mill Co., Nantucket Mills and German-American Co.; improvements to be made.

Stanley. Stanley Mfg. Co.; $100,000; A. P. Rhyne, pres.; H. A. Yount, sec. and treas.; succeeds Stanley Creek Cotton Mills.

PENNSYLVANIA.

Reading. Bancroft, Joseph & Sons (Wilmington, Del.); purchased Reading Cotton Mills of Garner & Co.; added new cards, looms and other equipment and operating as branch of Wilmington.

SOUTH CAROLINA.

Fingerville. Cohannet Mills; $100,000; John J. Mitchell, Jr., pres.; Craig S. Mitchell (Phila.), treas.; B. M. Aull, sec. and gen. mgr.; succeeds Fingerville Mfg. Co.

TENNESSEE.

Newport. Clifton Cotton Mills; $12,000; J. A. Fisher, pres.; W. D. McSween, sec. and treas.; taken over plant of the Bellevue Cotton Mills. (Idle.)

TEXAS.

Weatherford. Lone Star Cotton Mills; $75,000; C. C. Littleton, pres.; E. Martin, treas.; J. L. Lee, supt.; succeeded Weatherford Cotton Mills.

VERMONT.

North Pownal. Greylock Mills (North Adams, Mass.); purchased North Pownal Mills of Arnold Print Works; improving and will operate as branch of North Adams plant.

VIRGINIA.

Roanoke. Roanoke Twine Mill Corp.; $100,000; T. T. Fishburn, pres.; W. C. Ruffin, treas.; T. J. McNeely, supt.; new company succeeding Roanoke Mills Mfg. Co.

WOOLEN.

CALIFORNIA.

Dolgeville. Standard Felt Co.; Wm. G. Kerckhoff, pres.; Geo. M. Eggleston, sales manager; Wm. D. Mann, supt. of manufacturing, buyer mill supplies; offices at 96-98 Reade St., New York, and 282-284 Fifth Ave., Chicago; formerly Alfred Dolge Felt Co.

CONNECTICUT.

Norwich. Saxton Woolen Corp.; $75,000; L. J. Saxton, pres.; C. A. Saxton, sec.; L. Henry Saxton, treas.; successors to Clinton Mills Co.

MAINE.

Camden. Hall, S. G., Mfg. Co.; $40,000; J. H. Hall, pres.; S. G. Hall, treas., agt. and buyer; taken over Mt. Battie Mill.

Oakland. Oakland Woolen Mills Co., Inc.; $50,000; Chas. I. Lincoln, pres., agt. and buyer; W. H. Duval (N. Y.), treas.; new corporation succeeding Oakland Woolen Co.

Sangerville. Campbell Mfg. Co.; operated under lease by Dumbarton Woolen Mills, Dexter, Me., as Dumbarton, No. 2.

Sangerville. Carleton Mills Co.; merged with Sangerville Woolen Co. under firm name of latter.

MASSACHUSETTS.

Boston. Felters Co., The; $2,000,000; Wm. G. Faatz, pres.; Wm. J. Taylor, vice pres.; Herbert L. Bowden, treas.; succeeds Faatz-Reynolds Felting Co., Bowden Felting Mills Co., Nelson-Dedicke Felt Co.

Leominster. Rockwell Woolen Co.; $50,000; C. B. Smith, pres.; A. C. Rockwell, treas.; successors to Estate of E. M. Rockwell.

Northboro. Woodside Woolen Co.; $100,000; Edw. H. Smith, treas.; Robt. Illingworth, supt.; started up old Woodside Mills.

North Chelmsford. Silesia Worsted Mills; $1,500,000; Edward W. Atkinson, pres.; Andrew Adie, treas.; Mark Ingham, agt.; succeeded Moore Spinning Co.; additions made to equipment.

Pittsfield. Berkshire Woolen & Worsted Co.; $400,000; R. D. Gillett, pres.; J. R. Savery, treas.; D. T. Noonan, supt.; taken over woolen mill of J. L. & T D. Peck Mfg. Co.

Worcester. Davis, Geo. W., Inc.; $10,000; Geo. W. Davis, pres. and treas.; succeeds Southgate Woolen Co.

Worcester. Duffy, Geo. E., Mfg. Co.; $110,000; Geo. E. Duffy, pres., treas. and buyer; W. H. Arthur, supt.; succeeds E. D. Thayer Co.

NEW MEXICO.

Albuquerque. Wool Growers' Cooperative Woolen Mills; $25,000; Magnus Brown, pres.; Silvesta Mirabal, treas.; taken over Rio Grande Woolen Mills.

NEW YORK.

Stottville. Atlantic Mills (Providence, R. I.); purchased Stott Woolen Co.; operating as branch.

PENNSYLVANIA.

Brookville. Heidrick Woolen Co.; John Q. Heidrick, mgr. and buyer; started up old Brookville Woolen Mill on Wool and Merino Yarns.

Chambersburg. Melville Woolen Co.; plant at Fredericksburg, Va., destroyed by fire; bought plant of Chambersburg Woolen Co.

Philadelphia. Bunkin & Masteller; Howard and Palmer Sts.; succeeds Paul Bunkin & Co.

Philadelphia. Federal Worsted Co.; combines R. J. Prince, Robt. H. Shaen and Wm. Kimmerling Mfg. Co.

Philadelphia. Hardwick & Magee Co.; $4,000,000; Harry Hardwick, pres.; John Kendig, sec. and treas.; successors to Ivins, Dietz & Metzger Co.; enlarged plant.

Philadelphia. Ring, Mark D. & Co.; taken over Henry Spinning Mills at 3d and Somerset Sts.; Woolen Yarns.

Philadelphia. Wister Spinning Co.; $50,000; Everett H. Brown, pres. and mgr.; succeeds Germantown Yarn Mills of Joseph Fling's Sons.

RHODE ISLAND.

Providence. Paragon Worsted Co. (Woonsocket); purchased plant of Earnscliffe Worsted Mills; to move business to Providence.

UTAH.

Provo. Knight Woolen Mills; $150,000; Jesse Knight, pres.; R. J. Murdock, treas.; James Dow, agt., supt. and buyer; taken over and operating old Provo Woolen Mills.

WISCONSIN.

Jefferson. Owen, John E. & Son; started up old woolen mill on Woolen and Merino Yarns.

KNIT.

GEORGIA.

Columbus. Massey Hosiery Mills; C. L. Perkins, pres.; R. C. Jordan, vice pres.; J. D. Massey, sec. and treas.; succeeded Topsy Hosiery Mills and increased capacity 50 per cent.

MASSACHUSETTS.

Needham Heights. Saxony Knitting Mills; new name of John F. Brooks Co.; bought plant of Boston Hosiery Co., Boston.

MICHIGAN.

Grand Rapids. Swiss-American Knitting Works; $85,000; succeeded Clark Knitting Co.; new mill occupied and equipment increased.

NEW YORK.

Catskill. Union Mills; taken over mill of Wiley Mfg. Co.

Herkimer. Union Mills; purchased plant of Mark Mfg. Co.; extensive alterations made.

New York. Gotham Silk Mfg. Co.; succeeded Bernstein Ribbon Co., and added women's silk hosiery department.

Philmont. High Rock Knitting Co.; taken over plant of Aken Knitting Co. and operating as branch.

Utica. Frisbie & Stansfield Knitting Co.; $2,000,000; W. J. Frisbie, pres.; Geo. A. Frisbie, treas.; Chas. A. Byington, buyer; succeeded Camden Knitting Co.; Standard Spinning Co.; Kendall Knitting Co. and Richelieu Knitting Co.

Utica. Marshall Knitting Co.; succeeded Oriskany Falls Knitwear Co., Oriskany Falls, N. Y., and moved plant to Utica.

NORTH CAROLINA.

Newton. Fidelity Hosiery Mills; R. P. Freeze, sec. and treas.; successors to Newton Hosiery Mills.
Statesville. Steele Hosiery Mill; Le Roy C. & H. O. Steele, props.; succeeds Statesville Knitting Co.

OHIO.

Ada. Ada Knitting Co.; $15,000; J. H. Morrow, pres.; Clyde Sharp, treas.; W. H. Roper, mgr.; Women's Knit Underwear and Skirts; reorganization of Wapak Knitting Co. of Wapakoneta, O.

PENNSYLVANIA.

Clifton Heights. Linenwear Hosiery Co.; new name of Columbus Knitting Mills; new machinery added.
Fleetwood. Wanner, Chas. A.; successor to Madeira & Wanner.
Philadelphia. Excelsior Underwear Co.; removed main plant to 5155 Wakefield St. from Hatfield, Pa.; removed Phila. finishing dept. from Berkeley St. to above address.
Phoenixville. Parsons & Baker Co., The; $100,000; Chas. J. Baker, pres. and supt.; J. Clarence Parsons, treas. and buyer; new corporation succeeding Parsons & Baker.
Pottstown. Vaughan Knitting Co.; taken over plant of Searles Knitting Co. and increased equipment to 200 knitting machines.
Schuylkill Haven. Schwenk & Co.; I. L. Lautenbacher, buyer; succeeds McWilliams Bros.

TENNESSEE.

Knoxville. Holston Underwear Mills; $50,000; F. A. Weiss, pres.; Chas. M. Cooley, sec. and treas.; John C. Biddle, supt.; consolidation of Harriman Knitting Mill, Harriman, Tenn., and Biddle Mfg. Co. of Knoxville.

SILK.

CONNECTICUT.

Middletown. Cheney Brothers (South Manchester); leased plant of York Silk Mfg. Co.

NEW JERSEY.

Hackensack. Schwarzenbach Huber Co.; purchased Hackensack plant of Givernaud Bros.
Paterson. The Van Raalte Silk Co. has purchased the plant of the Manhattan Silk Co. and are running it as an annex to their veiling plant.

NEW YORK.

New York. Arlington Silk Co.; 124th St.; succeeded Manhattan Ribbon Co., Paterson.

PENNSYLVANIA.

Scranton. Alhambra Silk Co.; $25,000; new corporation succeeding Lackawanna Throwing Co.
Weatherly. Roscoe Broad Silk Mill; $5,000; John G. Hutchinson, supt.; reorganization of Weatherly Silk Mfg. Co.

MISCELLANEOUS.

NEW JERSEY.

Waldwick. Lancashire Bleaching & Finishing Co.; $160,000; Paul B. Welles, pres. and buyer; B. Semel, treas.; Cotton Bleaching and Finishing; taken over plant of Arkwright Mfg. Co.

NEW YORK.

New York. Yazoo Mills; succeeded by James Thompson & Co. of Valley Falls, N. Y., and New York City.

PENNSYLVANIA.

Philadelphia. Frankford Bleachery; John J. Flynn, prop.; succeeds Lafayette Bleachery.
Philadelphia. United States Thread Co.; $100,000; new corporation succeeding Upham Bros. & Co.

Enlargements and Improvements.

COTTON.

ALABAMA.

Huntsville. Abingdon Mills; installed new looms to replace old equipment.
Huntsville. Lowe Mfg. Co.; built new weave shed, 80 by 144 ft., and installed 300 looms.
Roanoke. Handley, W. A., Mfg. Co.; built 2-story weaving mill and equipped with 120 looms.
Spigner Station. Alabama Cotton Mills; added 2,000 spindles; improved plant and changed from steam to electric power.

CANADA.

Ontario. Cornwall. Canadian Cottons, Ltd., Canada Mill; installed cop dyeing plant of 30,000 lbs. weekly capacity; also roving and beam dyeing plant of 25,000 lbs. capacity weekly.

CONNECTICUT.

Danielson. Quinebaug Co.; erected engine house, 2 stories; new engines installed.
Willimantic. American Thread Co.; erected new bleach house, 3 stories, 75 by 220 ft.

DELAWARE.

Wilmington. Bancroft, Joseph & Sons Co.; capital increased to $5,000,000; built addition to mercerizing house and concentrated all lawn frames in Rockford plant; purchased Reading Cotton Mills, Reading, Pa.

GEORGIA.

Atlanta. Fulton Bag & Cotton Mills; built $100,000 addition to bag department.
Fitzgerald. Fitzgerald Cotton Mills; equipped weaving department with 140 looms.
Manchester. Manchester Cotton Mills; added 108 looms; built addition 50 by 100 ft.
Quitman. Atlantic & Gulf Mills; expended $50,000 for new equipment to make combed Sea Island yarns.

ILLINOIS.

Zion City. Zion Lace Industries; installed new lace machinery to double output.

MAINE.

Biddeford. Pepperell Mfg. Co.; building 6-story cotton warehouse; added to power plant.

MASSACHUSETTS.

Adams. Berkshire Cotton Mfg. Co.; installed new combers.
Adams. Renfrew Mfg. Co.; built addition to jacquard weave shed.
Cambridge. Boston Woven Hose & Rubber Co.; building 3-story and basement addition, 66 by 97 ft., to be equipped for making cotton belting.
Chicopee Falls. Chicopee Mfg. Co.; added $100,000 to capital and built new weave shed, 252 by 140 ft., with space for 650 wide looms.
Clinton. Lancaster Mills; increased capital from $600,000 to $1,000,000; building new 5-story mill, 400 by 120 ft.
Fall River. Granite Mills; installed spinning frames in No. 2 Mill to replace mules.
Fall River. Narragansett Mills; built two additions and increased equipment to 14,688 mule, 29,056 ring spindles and 1,233 looms.
Fall River. Stafford Mills; built addition to No. 2 Mill of 15,000-spindle capacity; installed 1800-h. p. engine.
Hebronville. Hebron Mfg. Co.; installed 3 new 250-h. p. boilers.
Housatonic. Monument Mills; built new weave shed and equipped with 40 looms.
Lawrence. Arlington Mills; new storehouse, 6 stories, 100 by 200 ft.; extensive changes in picker house; cost of improvement $150,000.
Lowell. Boott Mills; extensive changes in power department.
Lowell. Hamilton Mfg. Co.; made alterations in building formerly used for storage and installed looms on three floors; Print Works Dept. sold to Pacific Mills, Lawrence.
New Bedford. Beacon Mfg. Co.; built addition 1 story, 100 ft. square, to be used as dye house.
New Bedford. Dartmouth Mfg. Corp.; built additions to cloth room, picking department and storehouse.
New Bedford. Taber Mill, Inc.; increased capital to $1,300,000; built addition and installed 700 new looms.

Newburyport. Warner Cotton Mills; replacing part of old spinning equipment with 15,000 new ring spindles.
Salem. Naumkeag Steam Cotton Co.; installed 8 new vertical boilers of 200 h. p. each.
West Warren. Warren Cotton Mills; built 2-story addition to replace old dye house.

NEW HAMPSHIRE.

Manchester. Stark Mills; installing new pickers, 360 new cards and 500 new looms.
Newmarket. Newmarket Mfg. Co.; installed new cards, spindles and humidifying equipment.
Suncook. Suncook Mills; built addition to cloth room; added new carding, drawing, spinning, spooling, warping and slashing equipment.

NEW JERSEY.

Florence. Florence Thread Co.; built addition four stories high, 50 by 70 ft.; increased output about 1/3.

NEW YORK.

Clark Mills. Hind & Harrison Plush Co.; built 4-story addition, 225 ft. long.
New Hartford. New Hartford Cotton Mfg. Co.; increased capital to $200,000; built new bleaching and finishing plant.

NORTH CAROLINA.

Burlington. Glen Raven Cotton Mills Co.; built and equipped new dye house.
Concord. Young-Hartsell Mills Co.; built weave shed, 75 by 130 ft., to be equipped with 200 looms.
Durham. Golden Belt Mfg. Co.; addition to bag factory, 3 stories, 75 by 120 ft.
Fayetteville. Victory Mfg. Co.; added 1,800 spindles and 40 looms.
Lenoir. Moore Cotton Mill Co.; increased paid in capital to $150,000 and added 2,400 spindles.
Lowell. Peerless Mfg. Co.; installed combers and changed from carded to combed yarns.
Lumberton. Lumberton Cotton Mills; built dye house of concrete construction.
Monbo. Turner Mills Co.; $350,000; consolidation of Turner Mills Co. and Monbo Mfg. Co.; new 2-story mill built, 80 by 300 ft.
Rockingham. Hannah Pickett Mills; built weaving mill, 100 by 225 ft., and installed 400 looms.
Salisbury. Salisbury Cotton Mills; built 1-story weave shed, 74 by 80 ft., and added 80 new looms.
Salisbury. Vance Cotton Mills; increased capital from $100,000 to $300,000; plant to be enlarged.
Weldon. Shaw Cotton Mills, Inc.; added new machinery to increase output 40 per cent.
Worth. Harden Mfg. Co.; installed 4,160 ring spindles and 2,000 twisted spindles.

OKLAHOMA.

Guthrie. Pioneer Cotton Mills; increased capital from $150,000 to $240,000 to install new looms for weaving duck.

PENNSYLVANIA.

Phoenixville. Byrne, Thos. F.; installed 400 braiding machines for silk and cotton shoe laces.
Wilkesbarre. Wilkesbarre Lace Mfg. Co.; added 4 new lace machines; plan to build $500,000 addition.

RHODE ISLAND.

Alton. Richmond Lace Works; addition, 2 stories, 220 by 60 ft., completed; new machinery added.
Central Falls. Waypoyset Mfg. Co.; capital increased from $200,000 to $1,000,000; large additions under construction, including weave shed, spinning mill, storehouse and power plant.
Pawtucket. American Textile Co.; addition completed, 243 by 108 ft.; capacity to be largely increased by installation of 30 lace machines.
Pawtucket. Slater Mfg. Co.; built new picker house and warehouse.
Providence. Fletcher Mfg. Co.; built 2-story addition; installed additional equipment.
Providence. Joslin Mfg. Co.; constructed new dyeing and bleaching plant with capacity of 75,000 lbs. daily.
Providence. Hebron Mfg. Co.; Grant Mill; installed 84 new 40-inch looms; building 2-story brick addition.
Woonsocket. Lawton Spinning Co.; capital increased to $1,200,000; additions made to spinning mill, carding mill and finishing department; equipment increased to 100,000 spindles.

SOUTH CAROLINA.

Anderson. Cox Mfg. Co.; added 200 new looms.
Anderson. Gluck Mills; expended $40,000 on additions to equipment, including 3,000 spindles and new power equipment.
Camden. Hermitage Cotton Mills; additional story built on picking and carding mill and additional machinery installed; new boiler added; plant overhauled.
Gaffney. Hamrick Mills; capital increased from $150,000 to $250,000; 2-story brick mill constructed and 15,000 spindles and 364 looms added.
Greenville. American Spinning Co.; replaced 192 36-inch looms with the same number of 40-inch looms.
Greenville. Poe, F. W., Mfg. Co.; increased capital from $500,000 to $1,000,000; building 2-story opening house; 3-story waste house, machine shop, and adding 10,000 spindles and other equipment to make total of 70,000 spindles, 1,650 looms. (Bought tract of land and may build new mill.)
Lando. Manetta Mills; added 40 new looms.
Lexington. Lexington Mfg. Co.; added new dyeing plant.
Liberty. name of Calumet Mfg. Co. changed to Maplecroft Mills and capital increased to $500,000; 2-story weave shed, 80 by 104 ft., erected and 200 looms installed.
Lockhart. Lockhart Mills; constructed addition, 2 stories, 111 by 140 ft.; added 6,048 spindles.
Rock Hill. Aragon Cotton Mills; added 8,000 spindles and 280 looms.
Rock Hill. Arcade Cotton Mills; capital increased from $200,000 to $360,000; added 6,200 spindles.
Rock Hill. Manchester Cotton Mills; built addition and installed 100 new looms.
Simpsonville. Simpsonville Cotton Mills; capital increased from $150,000 to $500,000; building additions to be equipped with 16,000 spindles and 400 looms.
Spartanburg. Spartan Mills; 6 new boilers installed in No. 1 Mill.
Wellford. Wellford Mfg. Co.; $40,000; W. M. Jones, pres.; S. V. Muckenfuss, treas. and buyer; succeeded Jordan Mfg. Co.; erected addition and installed 1,200 ring spindles.
Yorkville. York Cotton Mills; capital increased from $150,000 to $300,000; 160 40-inch looms added.

WOOLEN.

CANADA.

Ontario. Campbellford. Trent Valley Woolen Mfg. Co.; completed new weave shed and installed 40 looms.

CONNECTICUT.

Mechanicsville. French River Textile Co.; building addition, 95 by 165 ft., to be equipped with 100 looms.
Stafford Springs. Warren Woolen Co.; built new mill, 2 stories, 160 by 60 ft., for dye house, boiler house, dressing and twisting; bought mill formerly occupied by Stafford Worsted Co.; equipment increased and improved.
Talcottville. Talcott Bros.; built 2-story addition, 80 by 32 ft.; increased carding, spinning and weaving.

ILLINOIS.

Chicago. Olson Rug Co.; building new 5-story mill at cost of $60,000.
Chicago. Western Felt Works; built addition and nearly doubled capacity.
Hanover. Hanover Woolen Mfg. Co.; built new picker house, 60 ft. square.

KANSAS.

Topeka. Western Woolen Mill Co.; expended $10,000 for new machinery equipment.

MAINE.

Houlton. Houlton Woolen Mills; building new mill for woolen department.
Sabattus. Webster Woolen Co.; enlarged mills and power department and added new equipment.
Sanford. Goodall Worsted Co.; built 4-story addition, 80 by 60 ft., and installed combing and spinning machinery; a second addition under construction.
Waterville. Wyandotte Worsted Co.; capital increased to $175,000; two additions built and 4 sets of cards added.

MASSACHUSETTS.

Canton. Draper Bros. Co.; to build 2-story addition, 100 by 65 ft., and increase capacity.
Clinton. Victor Mfg. Co.; added woolen yarn department, 2 sets cards, 1,200 spindles.
Franklin. Franklin Yarn Co.; built addition, 75 by 35 ft., installed new boiler, picker and 6 cards.

Globe Village. Hamilton Woolen Co.; built addition to weaving department, 2 stories, 100 by 212 ft., at cost of $50,000; building new power plant.
Holyoke. Farr Alpaca Co.; built new 6-story mill; machinery equipment to be moved from old mill, which will be torn down to make room for another new mill.
Millbury. Felters Co., The; building new picker house, 1 story, 30 by 60 ft.
Millbury. Windle, W. W. & Co.; built addition, 56 by 40 ft., 3 stories, and installed new equipment.
Monson. Ellis, A. D. & Co.; built addition to weave room and 2-story engine house.
Pittsfield. Russell Mfg. Co.; built addition, 32 by 66 ft., 2 stories; installed new looms.
Plymouth. Standish Worsted Co.; built new dye house. 60 by 50 ft.; equipment for yarn and piece dyeing installed.
South Acton. South Acton Woolen Co.; installed 9 new cards.
Uxbridge. Hecla Mill (Am. Woolen Co.); built weave shed, 55 by 150 ft.; installed 100 looms.
Worcester. Worcester Woolen Mill Co.; built addition to office and weave room.

MICHIGAN.

Detroit. Armstrong Woolen Co.; capital increased to $75,000; built enlargement.

MISSOURI.

St. Joseph. Buell Mfg. Co.; remodeled plant and installed 16 new looms.

NEW HAMPSHIRE.

Marlboro. Monadnock Blanket Mills; installed auxiliary electric power equipment.
Newport. Brampton Woolen Co.; built new weave shed and added 22 looms.

NEW JERSEY.

Beverly. Standard Combed Thread Co.; building 2-story addition.
Passaic. Forstmann-Huffmann Co.; built addition, 5 stories high.

NEW YORK.

Albany. Huyck, F. C. & Sons; built addition, 60 by 100 ft.
Jamestown. Odsonia Mills (branch Cleveland Worsted Mills Co.); purchased Meadowbrook Mills of Wm. Broadhead & Sons; equipped with 6 combs, 10,000 spindles for making worsted yarns on Bradford and French systems, also 100 looms.
Malone. Lawrence-Webster Co.; built new mill to replace old frame mill and added 1 set cards and 6 looms.
Newburgh. Stroock Felt Mills; built addition to plant, 100 by 70 ft.; new office building, 60 by 30 ft.
Oswego. Becker, Chas. W. (Amsterdam); leased plant of Mohawk Mfg. Co.

OHIO.

New Bremen. Bakhaus & Kuenzel Co.; added 2 new looms and wool scouring machine.

PENNSYLVANIA.

Darby. Griswold Worsted Co.; increased worsted equipment and started Tussah silk yarn department; built new warehouse; enlarged power house and installed 3 boilers of 300 h. p. each.
New Cumberland. Susquehanna Woolen Co.; new power plant built; changed from steam to electric; six new looms added.
Philadelphia. Anchor Combing Works; Pearce & England, props.; bought Tracey Mills at 20th and Spruce Sts.; removing to new quarters and tripling capacity.
Philadelphia. Andrew's Mill Co., Inc.; built addition for dyeing department; added 2 boilers.
Philadelphia. Bromley, John & Sons; built addition, 2 stories and basement, 220 by 190 ft.
Philadelphia. Greer, Joseph; built additional mill at cost of $24,000.
Philadelphia. Read, Wm. F. & Sons Co.; building 5-story brick and concrete weaving mill, 35 by 200 ft.
Philadelphia. Ring, Jonathan & Son, Inc.; built 2-story addition, 300 by 60 ft.
Stroudsburg. Kitson, Thomas & Son; installed new boiler.
Woolrich. Rich, John & Bros.; built addition and installed 2 sets cards, 1,200 spindles and new looms.

RHODE ISLAND.

Allendale. Erected new addition, added 3,000 spindles.
Bridgeton. Prendergast, Wm. H.; building new boiler house and new dye house.
Bristol. Cranston Worsted Mills; building 4-story addition.
Esmond. Esmond Mills; increased capital to $1,250,000; added 6 sets of cards, looms, etc., increasing capacity 25 per cent.
Greystone. Benn, Joseph & Sons; built new spinning mill, new weave shed, dye house and increased power plant.
Woonsocket. Desurmont Worsted Co., Jules; building addition, 110 by 160 ft.; new French worsted machinery to be added.
Woonsocket. Woonsocket Worsted Mills; 3-story addition, 80 by 50 ft., constructed; machinery formerly operated by Stafford Worsted Co., Stafford Springs, Conn., installed.

WEST VIRGINIA.

Webster. Webster Woolen Mills Co.; added 4 looms, also 100-h. p. boiler and smoke stack.

WISCONSIN.

Milwaukee. Western Worsted Mills; built 2-story addition, 40 by 132 ft.; added 24 looms.

KNIT.

CANADA.

Ontario. Woodstock. Oxford Knitting Co., Ltd.; added new dyeing and bleaching plant; changed to electric power.

GEORGIA.

Columbus. Perkins Hosiery Mills; expended $25,000 for fly frames, cotton openers, electric motors, etc.

ILLINOIS.

Belleville. Belleville Hosiery Mills; increased capital to $30,000; built new mill and increased equipment to 90 knitting machines added dyeing and finishing department.
Chester. Chester Knitting Mills; increased capital to $100,000; taken over mills of J. H. Rickman at Sparta and Pinckneyville; built new dye house, added to finishing department and building new mill, 3 stories, 80 by 120 ft.
Chicago. Lorenz Knit Goods Mfg. Co.; increased capital from $50,000 to $125,000 and added new machinery.

INDIANA.

Fort Wayne. Old Fort Knitting Mills; increased capital to $200,000 and increased capacity 33 per cent.

KANSAS.

Wichita. Steiert & Co.; equipped hosiery department.

MASSACHUSETTS.

Ipswich. Ipswich Mills; capital increased to $600,000; built new 4-story mill; capacity increased about one-third.

MICHIGAN.

Bay City. World's Star Knitting Co.; built 4-story addition for underwear department.
Grand Rapids. Globe Knitting Works; built new 5-story mill; capacity increased.
Muskegon. Muskegon Knitting Mills; added new equipment, increasing to 76 knitting machines.

MINNESOTA.

Minneapolis. Northwestern Knitting Co.; built additional mill, 5 stories and basement, 150 by 150 ft., for manufacture of underwear.

NEW HAMPSHIRE.

Lakeport. Wood, H. H. & Co.; added story to mill and installed 600 woolen spindles.

NEW JERSEY.

Riverside. Taubel, Henry & Son Knitting Mill; increased equipment to 108 knitting machines.
Riverside. Taubel, Wm. F., Co.; building 4-story mill, 50 by 150 ft.

NEW YORK.

Amsterdam. Atlas Knitting Co.; increased capacity 20 per cent.
Amsterdam. Stewart, John K. & Sons; erected addition, 60 by 100 ft., to yarn mill.
Amsterdam. Van Brocklin & Stover Co.; bought new mill and increased capacity.
Herkimer. Union Mills; Gem Dept.; built 2-story bleachery building, 40 by 90 ft.
Hornell. Merrill Hosiery Co.; built addition, 135 by 85 ft., for manufacturing silk full fashioned hosiery.
Hudson. Swansdown Knitting Co.; building addition, 72 by 97 ft., to be used for picking, carding and spinning wool yarns.

Oswego. Lastlong Underwear Co.; built new 5-story mill, 130 by 60 ft.; new dye house and power plant.
Port Leyden. Port Leyden Knitting Co.; built 1-story bleachery, 40 by 80 ft.; added new knitting machinery.
Union Course. Nusbaum, D. & Co. (Brooklyn); building new mill; equipment to be increased.
Utica. Frisole & Stansfield Knitting Co.; building new mill for Kendall Dept., 4 stories, 150 by 50 ft.
Utica. Oneita Knitting Mills, Inc.; building addition, 30 by 200 ft., to increase output of combed yarn.
Watertown. Shaughnessy Knitting Co.; to build new 3-story mill.

NORTH CAROLINA.

Burlington. Whitehead Hosiery Mills; erected addition and added 40 knitting machines.
Durham. Durham Hosiery Mills, Inc.; capital increased to $1,000,000; extensive enlargements made.
High Point. High Point Hosiery Mills, Inc.; erected new mill and added 125 knitting machines.
Marion. Marion Knitting Mill; Inc.; added 25 knitting machines to make line of women's hosiery.
Winston-Salem. Shamrock Hosiery Mills Co.; built 2-story addition, 100 by 200 ft.; doubled capacity.
Zebulon. Zebulon Hosiery Mills; built and equipped dyeing and finishing department, also built addition to boiler room and installed 80-h. p. boiler.

OHIO.

Cleveland. Federal Knitting Mills Co.; built new mill at Detroit Ave. and W. 29th St.; increased capacity.
Cleveland. Green-Haas Schwartz Co.; building new 6-story concrete mill; capacity to be increased 50 per cent. (Formerly S. Schlessinger Knitting Co.)
Cleveland. Rich, N. J. & Co.; to move to new mill, 4 stories, 100 by 300 ft., under construction and more than double capacity.
Elyria. Fay Stocking Co.; erected new building; added new knitting and dyeing equipment.
Piqua. Superior Underwear Co.; built new 5-story mill.

PENNSYLVANIA.

East Stroudsburg. Kistler, A. W.; building addition, 28 by 44 ft.; capacity to be increased.
Harrisburg. Scharadin Mfg. Co.; built new mill, giving improved facilities; increased equipment.
Lewistown. Lewistown Knitting Co.; new knitting machines installed.
Newport. Romberger, H. A.; building additions and increasing capacity 100 per cent.
Philadelphia. Aberle, H. C. & Co.; erected 4-story addition, 50 by 70 ft.; added 32 new full fashion machines.
Philadelphia. Elk Knitting Mills; added new equipment to double capacity.
Philadelphia. German-American Hosiery Co.; increased capital to $350,000; added new equipment.
Philadelphia. Simons & Struve Hosiery Co.; built 4-story addition; increased equipment.
Reading. Consolidated Knitting & Spinning Mills; built new mill and added 104 knitting machines, 20 ribbers, 10 loopers.
Reading. Davies Hosiery Co.; purchased plant of East Pennsylvania Hosiery Co. and moved to newly acquired plant; increased equipment to 120 machines.
Royersford. National Underwear Co.; built new plant in Royersford; removing from Spring City and enlarging.

SOUTH CAROLINA.

Landrum. Blue Ridge Hosiery Mill; built addition to plant and doubled equipment.
Montmorenci. Hallman Knitting Mill Co.; $10,000; C. E. Hallman, pres. and treas.; 14 knitting machines added.

TENNESSEE.

Chattanooga. Davis Hosiery Mills; building addition 40 by 40 ft.
Knoxville. Standard Knitting Mills; building additions and installing equipment to give production of 600 dozen daily of men's ribbed underwear; new cotton yarn mill, power house, bleach and dye house, warehouse and knitting mill.
Lenoir City. Holston Mfg. Co.; capital increased to $350,000; built addition and increased output.

VERMONT.

Bennington. Cooper Mfg. Co.; built addition to finishing room, 65 by 55 ft.

VIRGINIA.

Berkeley. Chesapeake Knitting Mills; brick addition built and equipped for finishing.
Danville. Danville Knitting Mills; enlarged finishing room by erection of addition, 73 by 100 ft.

WEST VIRGINIA.

Martinsburg. Kilburn Knitting Machine Co.; expended $40,000 on enlargement, 2 stories, 59 by 140 ft.

WISCONSIN.

3-story addition and increased equipment to 60 knitters.
Depere. Oneida Knitting Co., Inc.; built addition, 45 by 55 ft.; increased equipment.
Delavan. Bradley Knitting Co.; building addition, 150 by 50 ft., 3 stories, also building another story on old mill.
Janesville. Lewis Knitting Co.; increased capital from $75,000 to $150,000; built new concrete mill and doubled capacity.
Milwaukee. Everwear Hosiery Co.; built new 3-story mill.
Milwaukee. Holeproof Hosiery Co.; building addition, 6 stories and basement, 80 by 60 ft., and dye house, 90 by 60 ft.; will add 150 new knitting machines.
Milwaukee. Phoenix Knitting Works; building new 6-story mill, 79 by 120 ft., at Chicago St. on Broadway, at cost of $85,000.

SILK.

NEW JERSEY.

Burlington. Burlington Silk Mills; building entire new plant.

NEW YORK.

Hornell. Huguet Silk Co.; erected additions; doubling capacity.
Port Jervis. Kattermann & Mitchell Co.; leased additional space and will increase from 120 to 150 looms.

PENNSYLVANIA.

Allentown. Hunsicker, Good & Co.; building new mill with capacity of 22 looms.
Landingville. Follmer, Clogg & Co.; new weave shed with capacity of 200 looms constructed; 50 looms installed.
Mayfield. Mayfield Silk Co., Inc.; planning enlargement to double capacity; $40,000 to be expended.
Philadelphia. Friedberger-Aaron Mfg. Co.; built 3-story mill and power house; to make further additions at total cost of $350,000.
Philadelphia. Orinoko Mills; built 3-story dye house and manufacturing building, 50 by 195 ft.
Philadelphia. Sibson & Stern; built 2-story addition, 50 by 77 ft.; increased equipment.
Siegfried. Central Silk Mfg. Co.; erected additions, increasing capacity by 164 looms and 8,000 spindles; new throwing mill at Northampton.

RHODE ISLAND.

Providence. American Silk Spinning Co.; installed additional machinery equipment.

MISCELLANEOUS.

CONNECTICUT.

Bridgeport. Henkels, Alb. & E.; built addition to double capacity; make Torchon Laces.
Jewett City. Aspinook Co.; made additions to power plant and installed 2 boilers and engine.

MAINE.

Lewiston. Lewiston Bleachery & Dye Works; completed 2-story and basement addition; began work on new fast black dye house, 2 stories, 200 by 60 ft.

MASSACHUSETTS.

Lawrence. Lawrence Dye Works Co.; built and equipped large addition.
North Brookfield. Oxford Linen Mills; making extensive additions to buildings and equipment.

NEW JERSEY.

Hawthorne. American Silk Dyeing & Finishing Co.; replaced frame building with stone structure.
Somerville. Cott-a-lap Company; removing from New Haven, Conn., to buildings formerly occupied by Somerville Mfg. Co.; purchased business of Texta-dor-na Mfg. Co., Columbus, O.; capital increased to $100,000.

NEW YORK.

Chadwick's Utica Willowvale Bleaching Co.; built new engine house and boiler house; installed 3 new boilers and 400-h. p. direct connected unit for electric power.

New York Mills. New York Mills; built new 2-story bleachery, 180 ft. square, at cost of $45,000
Wappinger's Falls. Garner Print Works & Bleachery; building additions and making extensive alterations and improvements in equipment.

PENNSYLVANIA.

Allentown. Lehigh Bleaching & Dyeing Co.; built addition and equipped for dyeing blacks on hosiery.
Allentown. Pickup & Kean, Inc.; built and equipped addition for mercerizing cotton yarns.
North Wales. Asbestos Fibre Spinning Co.; built addition, 106 by 50 ft., 2 stories; enlarged power plant and installed new 150-h. p. engine.
Philadelphia. Courtrai Linen Thread Co.; made improvements costing $100,000, including new brick dye and bleach house, 80 by 40 ft.; new equipment.
Philadelphia. Edgewater Print Works; H. E. Perry, prop.; building new 4-story concrete mill at Frankford Ave. and old Front St., for dyeing, printing and finishing cotton goods and burlap.
Philadelphia. Hulton Dyeing & Finishing Co.; built new mill, 4 stories, 100 by 125 ft.
Philadelphia. Meyer, Robert; enlarging plant and adding process for dyeing cotton and silk mixed hosiery.
Philadelphia. Ontario Dyeing Co.; built 4-story addition, 161 by 109 ft.; a second addition to be built, 4 stories, 56 by 109 ft.
Pottstown. Bramcote Dye Works; installing machinery for finishing hosiery.

Pres. William Whitman Will Retire.

President William Whitman of the National Association of Wool Manufacturers announced at a meeting of the executive committee in Boston on Dec. 6th that on the expiration of his present term of office, Feb. 1, he should not be a candidate for re-election.

Mr. Whitman said in an address to his fellow manufacturers that he took this step with deep regret; that, though the burdens of the post were heavy, the pleasures were great. He spoke of his pleasant acquaintance with the distinguished public men who had directed the course of national legislation.

"The association has had a continuous, active, successful life for forty-six years," he said, "and as I relinquish the office of president it is with pride and satisfaction that the resources of the organization are greater, its membership more representative, and its unity more complete than ever before.

"We live in a wonderful age," said Mr. Whitman, "in a land of stupendous achievement. But when all conditions, all difficulties are considered, I doubt whether any field of industrial endeavor has witnessed a triumph more significant, more decisive than our own.

"I have reached an age when I value more and more, and perhaps deserve, the solace of peace and quiet after long years of strife. My own business, the interests of my associates, the desires of my family, all make their imperative demand."

Mr. Whitman's fellow manufacturers of the committee expressed their keen regret at his announcement, and a committee was appointed to prepare suitable resolutions, to be presented at the annual meeting.

A nominating committee, to select a new list of officers, was chosen.

Mr. Whitman has been a staunch defender of the wool and woolen tariff schedules for many years. He has been president of the association for a longer period than any of his predecessors in that office and in every tariff revision since 1880 has had an important part in presenting the views of the National Association of Wool Manufacturers.

Men may differ with Mr. Whitman concerning the schedules which he has advocated and yet freely and fully concede his great ability, his knowledge of the intricacies of the textile tariff and his untiring energy in defense of the policies for which the association stands.

While his associates must acknowledge his well earned right to retire from active leadership if he so desires, they will find it difficult to select a successor who will combine his knowledge, experience and vigor.

The lace making industry of Venice employs about 6,000 girls, 2,000 of whom are employed by one firm. The total export of this article for 1909 has been about $750,000.

There are 140 cotton spinning and weaving mills in Russia in which there are 8,132,338 spinning spindles and 139,964 looms, employing 399,900 workmen.

Fire in Textile World Record's Offices.

Fire in the building occupied by the editorial and publishing offices of the Lord & Nagle Company, publishers of the Textile World Record, caused serious damage on Dec. 9 and rendered our quarters unfit for occupancy. We are temporarily located on the street floor of the adjoining building at 156 Congress St.

The Meeting of the American Association of Woolen and Worsted Manufacturers.

The fourth annual meeting of the American Association of Woolen and Worsted Manufacturers was held at the Waldorf-Astoria on Dec. 8. The morning and afternoon sessions were devoted to trade topics, routine business, the election of officers and the reading and discussion of several technical papers.

Officers were elected as follows:

Frederick S. Clark, president; Louis B. Goodall and Thomas H. Wilson, vice presidents; Herbert E. Peabody, secretary; Richard A. Strong, treasurer; Richard A. Strong, William H. Folwell, Robert T. Francis, F. W. Freeman, William J. Batey, executive committee; John M. Clark, actuary.

The feature of the meeting of greatest interest was the banquet which was held in the evening in the ball-room of the Waldorf-Astoria. More than 300 members were present and the atmosphere was charged with electricity, which found frequent vent in the remarks of the different speakers. The chief speaker of the evening was Prof. Henry C. Emery, chairman of the Tariff Board, which has charge of the investigation of costs of manufacturing. Mr. Emery made some plain statements to the manufacturers and listened to some very plain talk from the other speakers. In introducing Prof. Emery President Frederic S. Clark of the association made a lively attack on amateur tariff muckrakers, welcomed the professor's expert investigation and said that tariff agitation should cease until the tariff board has time to present its final conclusions.

Prof. Emery spoke in part as follows:

I thank all you gentlemen at least for not telling us lies. Now, can we or can we not get at the truth of this cost of production business? Paper producers have reported to us accurately. Can you? (Cries of "No!" "Not at all!") I believe on the contrary that your industry can give us definite returns. They will not be exact. But you ask, "Are they worth while, once you get them?" I'm not at all sure of it. But let us try and see. Realize what our problem is. If it is a silly investigation, change the law. Don't malign us. We are under the law. Are you willing to be honest with the Tariff Board? . . .

Hitherto the policy behind tariff legislation has been this: Whenever a man wants protection give it to him and then let somebody else show us where he's wrong. All that is wrong, I say. If the man cannot show first why he should have protection don't protect him. As for this dreadful tariff board, it has no powers. I am its chairman and I have no powers. I might almost say there is no "tariff board." The President appointed certain persons to find out certain facts. I am one, and likely soon to be abolished. But assuming that the tariff board lives, I assure you there'll be no lynch law about it. We provide every interest with a fair chance to show its hand. Our cards are on the table. Now, gentlemen, where are yours?

Charles Heber Clark of Philadelphia, after apologizing to Prof. Emery as "the enemy in our midst," made a vigorous speech in which he took issue with Prof. Emery. He denounced all Philadelphia and New York editors as ignorant of the tariff, and defended protection by comparison with English industrial conditions and references to our development in certain manufactures. He spoke in part as follows:

One part of Prof. Emery's speech is offensive to me and I am going to ask him to allow me to be very frank in saying so. He considers the tariff a favor given to us manufacturers who apply for it. If he has any such idea he is sadly astray. Who is the Caesar to whom we must go to beg this favor?

Ignorant editors speak of plundering trusts. Why, trusts were formed to keep prices down and save the waste of competition. If you find a crooked trust, you will find that it was not created by the tariff, but by the crooked railroad officials. The railroad, and not the tariff, is the father of the objectionable, crooked trusts.

The tariff was made so that the industries of our own country should thrive. It simply supplies a fence for the garden.

Dr. Frederic W. Hamilton, president of Tufts College, made a scholarly speech on general protection principles.

Joseph Smith, secretary of the Lowell Textile School, made a witty speech which was a hit of the evening, using many classical allusions that were received with much laughter and applause.

Marcus M. Marks, president of the National Association of Clothiers, also made an interesting speech on "Service."

The last form of this issue of the Textile World Record was held open a day longer in order to report fully the meeting of the American Association of Woolen and Worsted Manufacturers in New York on Dec. 8. Unfortunately in the early morning of the 9th our editorial and publishing offices were burned out, so that we must apologize for shortcomings, particularly in this report.

A paper was read by Lionel Kremer on standards and business efficiency and organization, but the copy which was forwarded to us went astray in the confusion of the fire in our premises so that we are unable to print it in this issue.

H. L. Gantt's paper is as follows:

Industrial Efficiency.

BY H. L. GANTT.

About fifteen years ago the financiers of this country discovered a new and seemingly a very important principle. They realized that in many cases, at least, large factories were making a larger percentage of profit than small ones, and conceived the idea of uniting the small ones under one system of management. By this move they certainly did give the small factories a better financial standing, at the same time reducing what might be called the financial or business expense.

This move also reduced competition, and decreased the cost of selling, which has always been a large element of expense. Under these conditions business prospered rapidly, for there was in many cases undoubtedly a reduction in cost. The illustrated magazines were filled with the pictures of the captains of industry that had engineered these combinations, and it was freely predicted that the economies to be obtained were so great that it was only to be a question of time before Europe would be flooded with American goods.

Magazine articles of this character were extremely popular for three or four years, and the formation of consolidations or trusts in manufacturing, and of great systems in railroading, went on at a rapid rate. The economies that had been produced under these methods, together with the fact that, with the elimination of competition, the selling price had been upheld, enabled many such combinations to pay dividends on stock which had originally represented little or no value.

The unprecedented prosperity that followed the introduction of these methods was undoubtedly caused at least in a large measure by them, and the financier was justly regarded as having done much to promote the prosperity of the country. Our interial trade grew at an astounding rate, but the American invasion of Europe did not materialize; and it was not very long before we began to hear complaints of the inefficiency of labor. Wages began to rise, but the output of the workmen did not rise correspondingly. The financier had undoubtedly effected economies on those portions of business directly under his control, but had not succeeded in producing a similar effect on those with which he did not come in direct contact.

As a matter of fact, while the financier had been forming his great combinations of manufacturing interests and railroads, with the effect, at least as far as the public is concerned, of upholding prices, the workmen had gone them one better. By their unions not only have they upheld the price of their labor, but in many cases markedly increased it, without rendering any more service than formerly; the manufacturers, in many cases, say less.

Under these conditions the projected invasion of Europe seems to be postponed indefinitely, and the continually increasing cost of living in this country seems to indicate that we need something more than able financiering to round out our theory of Industrial Economy.

Harrington Emerson has said that the financier looks at industrial problems through a telescope, when he should use a microscope. As a matter of fact both a telescope and a microscope should be used.

The financier himself must use a telescope, for he cannot get into the mechanical details, but he should have under him a corps of men who could, metaphorically speaking, use microscopes, men trained in the methods of scientific investigation, capable of studying every problem in detail and of effecting permanently the economies that scientific investigation suggests.

This naturally divides itself into two parts, finding out how things should be done, and doing them that way ever afterwards. It is not easy to find men capable of performing either of these functions satisfactorily, and as a rule the financier does not sufficiently appreciate the importance of this work when the men have been found, and they are soon lured away by the selling department, the importance of which the financier does appreciate, and which is compensated accordingly.

On this subject I quote from my book on "Work, Wages and Profits":

"Inasmuch as increase of selling price apparently yields more prompt returns than reducing costs, and returns that can be measured with greater accuracy, much of the talent of our manufacturers has been engaged in this branch of the business. The successful salesman, or the operator who has succeeded in persuading his competitors to join with him in upholding or advancing prices, on account of the increased profits resulting from his efforts has been considered a very important man and compensated accordingly. The recognition of ability, and the compensation for success in this field, have been so great that capable workers from all directions have swarmed into it, and the industry of making prices has prospered amazingly, to the comparative neglect, often, of the production end of business.

"With increase of prices comes higher cost of living; with higher cost of living comes demand for higher wages; with higher wages usually comes higher cost of production. Then, to maintain the same profit under the new conditions, we must again increase our selling price, and the cycle repeats itself. This process has been going on for years, and the producers have been gradually attracted from the field of making products to the more lucrative one of making prices.

"Let us now consider the other alternative—that of reducing cost—and ask why more attention has not been paid to it, and what we may expect to get if we cultivate this field as assiduously as we have done the first.

"The first cause of the small interest hitherto shown in the effort to improve production is that there is still a lingering feeling among many prominent people that the shop worker is not entitled to the same degree of consideration as the office worker; and this work cannot be done in the office. It must be done amid dirt, dust and the noise of machinery. It must be done by not only studying individually the machines that do the work, but by also studying individually the men that operate them. This is work that requires ability quite as great as, if not more greater than, that needed for the making of prices; it also requires long hours and overalls; and the compensation for success in this line does not compare with that accorded the man who adds to the bank account by getting a higher selling price.

"On account of these conditions the effecting of economies in factories is usually left to the partially educated mechanic or clerk, who, whatever his success, seldom gets an adequate reward. When the compensation for success in this latter branch is made commensurate with that in the former, and then only, will it attract and hold the most capable men, to whom we must look for the success in any work requiring study or investigation. Study of men and processes is difficult, and we have done but little in this country to encourage it; but the time has come when we must turn our attention to it at once, for the combination of the high cost of living, and the inefficiency of production in almost all lines, is rapidly producing a condition of which no one can foresee the result."

Although this was written only a few months ago, we already have one result, namely, a demand for increased rates by the railroads.

"The horizontal increase of wages being granted by so many corporations throughout the United States is not a cure, but an expedient only, which enables the workmen to supply themselves for the present with a larger proportion of the necessities of life. Such a scheme provides temporary relief only, for a general increase of wages increases costs again; and, if such a policy is followed, it will not be long before a new increase of wages will be needed to meet the continually rising cost of living.

"The one cure, the only one, for the condition that confronts us, is to increase the efficiency of the producer. This is not an easy problem; and there is no royal road to the desired end, for, as was said before, it means long hours and overalls, and the ability to study men and machines in the surroundings of dirt, dust and noise.

"As said before, also, this work does not attract many educated or capable men, because the compensation for success is so meager; but the time is rapidly approaching when the men that can do this work well, will be in demand at almost any price. This is peculiarly the work of the mechanical engineer, and manufacturers who realize this fact and take advantage of it will be surprised at the benefits.

"It is an economic law that large profits can be permanently secured only by efficient operation; and any man, or body of men, that exacts a compensation out of proportion to the service rendered will ultimately come to grief. The supreme importance of efficiency as an economic factor was first realized by the Germans, and it is this fact that has enabled them to advance their industrial condition, which twenty years ago was a jest, to the first place in Europe, if not in the world. We naturally want to know in detail the methods they have used; and the reply is that they have recognized the value of the scientifically trained engineer as an economic factor.

"Although the application of the scientific method to the larger problems of engineering and manufacture has been most rapid within recent years, and the great advances made testify to its success, its application to the innumerable small details of work has been largely neglected. These details have been regarded as being in the domain of trades rather than of engineering, and have been left to the mechanic. Inasmuch as mechanics, as a class, get but little benefit from the development of a better method, or a labor-saving process, they are as a rule little interested in such improvements. It is not surprising, therefore, that labor unions should offer a distinct opposition to such improvements, and that workers trained in the atmosphere of the union should consider it their duty to perpetuate this hostility. To avert this hostility we must begin by giving workmen a different training.

"Before the advent of the modern factory system, each master workman owned his little shop, which he ran with the assistance of two or three journeymen; and in which he personally superintended the training of his apprentices. In training apprentices, his first object was to provide himself with capable journeymen; but he also realized that the best way to increase his reputation was to send forth men that should be a credit to him. He was therefore doubly particular that no one should leave his shop who was not able to do his work well.

"With the coming of the factory system, the owner became too busy to give much personal attention to the apprentices, and as the factories grew larger, he was often unable to take from the business end enough time to make himself even a master workman in all branches of his work. With the increasing size of the factory the superintendent also became too busy to give much personal attention to the apprentices, and they were thus left to receive their training from the foreman and their fellow workmen, who, as a rule, have no financial interest in training additional men, who may, in time, become their competitors. This is undoubtedly the most important reason why the old apprentice system has gradually become less effective, until today it is almost obsolete. It is also a good reason why an attempt to revive it in its old form is foredoomed to failure.

"There is really no sharp line between mechanical engineering and trades. Whenever there is a problem to be solved, no matter how small or commonplace, there is work for the educated man; and his solution by the scientific method is, as a rule, so much better than that of the mechanic without scientific knowledge, that workmen trained in the light of such a solution are far more efficient than those trained by mechanics in their

methods. The increased efficiency of such men entitles them to increased compensation; and, by awarding that compensation in a proper manner, I have never failed to secure the hearty cooperation of the good men. A system of management based on these methods is just as much a part of our assets as plant, or equipment.

"We are familiar with plants that were failures under one manager and successes under another, or vice versa; but so far no satisfactory method is generally known by which a system of management can be put into such a shape as to be self-perpetuating. This is exactly what the methods referred to do accomplish, at least to a large extent. The importance of this fact is second only to that of one other, namely, that they do actually get the highest possible efficiency.

"If the same intelligence and industry had been applied generally to the act of production as has been exercised in selling products, I can hardly help feeling that we should be suffering less acutely today from high prices. In the long run prices are governed by supply and demand. When it comes to be generally realized that efficient production and a large, cheap, product form a more stable basis for profits than a small, expensive one because they form a more stable basis for prosperity, we may hope that some of the talent that has been exploiting the overworked field of making prices will return to the comparatively fallow field of making products.

"If the much boasted superiority of the American people is really a fact, and the phenomenal progress of the past is really due to the ability of the people of the United States and not mainly to splendid natural resources, we should rise to the

FREDERICK S. CLARK, RE-ELECTED PRESIDENT OF THE AMERICAN WOOLEN AND WORSTED MANUFACTURERS ASSOCIATION.

occasion, and become the example for others to point to. This cannot be done by making prices; and a tariff that is so high as to enable profits to be made regardless of cost is not a protection, but a decided detriment to the country. A tariff that encourages efficiency is more to be desired than that which will enable its beneficiaries simply to accumulate wealth, for any prosperity not based on efficiency is on an unstable foundation."

Bradford Numbers for Tops.

Editor Textile World Record:

I wish you would state for me the connection between the Bradford numbers, 40s, 60s, etc., used as quality numbers for tops and wool and the yarn numbers to which these designations will actually spin. A friend says Bradford sixties tops will produce a 60s 2-fold yarn. I know he is wrong.

Andrews (1223).

The connection is rather uncertain and remote in these days. The numbers given to tops are not necessarily an index of their spinning length. They are what "Andrews" calls them—"quality numbers." Thus there are plenty of so-called sixties tops which are neither fit nor intended to spin beyond 24s. They are "sixties" only by virtue of the fineness and quality of the fiber; not because of its length. It has to be understood that any topmaker is at liberty to christen his blends as he likes and that the spinner judges not by the name, but by the sample. Standards deteriorate in time and the denominations given to tops do not signify what they used to. The deterioration is irregular, some makers keeping a better standard than others. Nobody thinks of trying to make 48s out of market 60s, but this length is often spun from 58s or 56s tops, the quality then being fine crossbred. If merino quality is wanted, 64s or a highly super 60s must be used. The numbers may be misleading, but so would they be if based exclusively on length without regard to fineness. Perhaps the least objectionable way out is found by those topmakers who offer samples under their own marks and let customers call them what number they please.

"Sixties" is the most ambiguous and artificial of names, but the case is not so very different with 40s. To spin 40s yarn a 46s top is taken for medium coatings. The nominal 40s top may not spin much beyond 20s, but good 40s colonial will go to 32s safely and good 40s English to 36s. There used to be an abundance of tops described as 32s, but the former 32s now masquerade as 36s and the 36s by one of time's changes have mostly become 40s. These changes date from twelve or fifteen years ago when crossbred material was excessively high in price.

"Names are nothing" say buyers emphatically and enough has been said to show that Bradford top numbers have to be interpreted with understanding. Every spinning mill has its own individualities in the character of yarn turned out and yarns from different mills of one count and nominally one quality show different characteristics. "The sample is the thing," the buyers unanimously declare and this is so in yarn and cloth as well as in tops. Knowing the purpose in view, the topmaker of course submits the samples that are the most likely and may caution the spinner against using another of the same name. Similarly, the spinner will guard himself from claims by warning the manufacturer that such and such is not suitable for a warp-faced or a filling-faced fabric. In view of the immense diversity of cloths made from Bradford yarn a perfect standardization of tops must be a very long way off and any system of naming must have its pitfalls.

The annual production of yarn in Russia averages about 162,000,000 pounds. The principal exports from Japan to China in 1909 were as follows: Cotton yarns, $14,570,340; cotton manufactures, $2,479,217; drills, $1,655,164; all other, $539,797; or a total of $4,674,178.

During the first nine months of 1909 the shipments from Leeds to the United States was as follows: Woolens, $24,880; worsted, $3,715, and for the same period in 1910: woolens, $44,589; worsteds, $10,097.

The American exports of raw cotton for the twelve months ending August, 1910, were 6,330,276 bales, valued at $460,093,295. This was 2,236,066 bales less than the previous year, but the value was $40,748,237 greater than the shipments for the twelve months ended August, 1909.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

THE PRINTING OF RSAKINNYE.

BY ROBERT DANTZER.

(Translated from the French by the Editor of the Textile World Record.)

As is well known yarn can be printed in two ways: 1, in the form of a warp prepared for the loom; and 2, in skeins. The first method, which is the oldest, is used for silk and carried on in nearly the same way as cloths are printed, consequently it will be unnecessary to give a detailed description of this process. The process of printing warps as used for tapestry carpets was invented in 1832 by Robert Whytock of Edinburgh, Scotland, and afterwards perfected by Grossley of Halifax. The yarn for carpets is wound on large reels and generally printed on a flat bed, sometimes on the reel itself. The Hoffmann machines are extensively used for this class of printing.

The printing of skein yarn dates from the latter part of the 18th century and the discovery of the process is attributed to Alexander Decreme of Roubaix. The skeins are stretched tightly and then printed on both sides in such a way that the color penetrates the yarn thoroughly. Several methods of printing are in vogue and can be divided into two classes, (a) printing by the dyeing process, and (b) regular printing. The first class

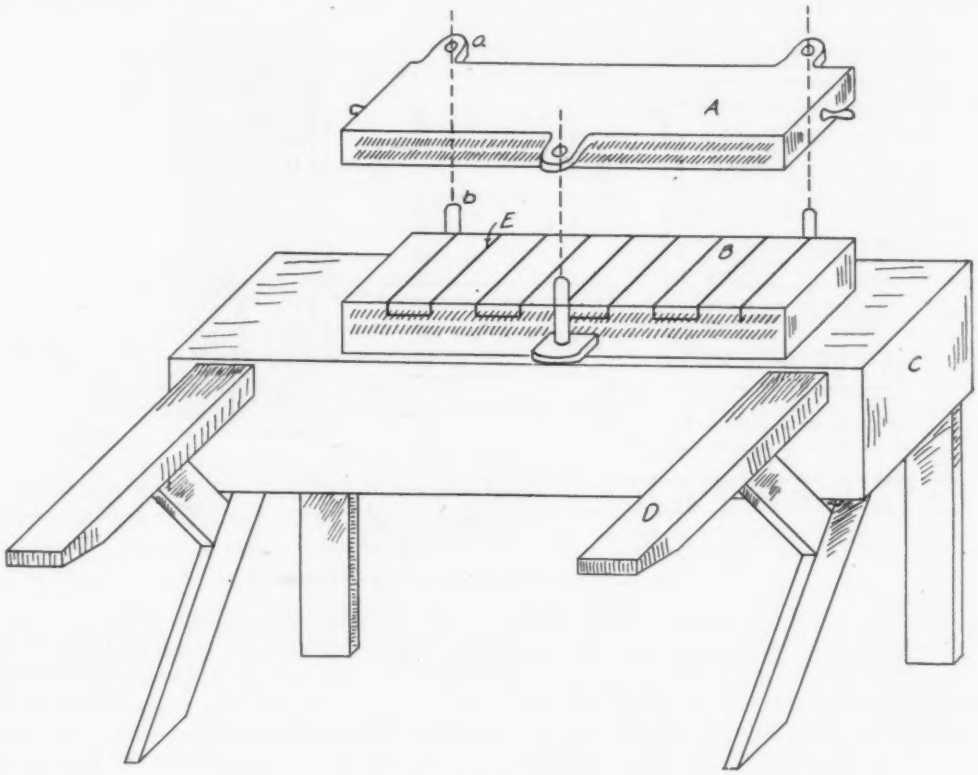


FIG. 1. BED FOR PRINTING.

(a) comprises the following effects: a, shaded; b, flame; c, dyeing. The second class, (b) includes the following: d, jasper; e, flame; f, cameo. The yarn printed by these processes is used for fancy fabrics, carpets, knit goods, etc.

A. DYEING PROCESS.

(a) Shaded. The yarn treated by this process is all one color, but is light at one end and grows steadily darker until the other end is reached. It gives a changeable effect to the fabric. The skeins to be treated are stretched on wooden frames which are morticed to receive cross bars. The skeins having been stretched on the frame, one against the other, the various frames are suspended by a windless carrying two pulleys. The lower part of each frame is weighted with lead or iron. The frames are then lowered into the dye bath, which contains but a small quantity of the dyestuff. At the end of five minutes the frames are slowly raised until the skeins project slightly from the liquor. They are left in this position for another five minutes and then raised slightly, this process being continued until the dyeing is completed. In this way the depth of the shade is graduated from one end of the skein to the other. Usually the skeins are treated for several minutes in a solution containing 2 pounds of soap to 100 pounds of water heated to 75° to 100° F. This method is usually employed for wool yarn.

(b) Flame Effect. Yarn dyed by this process has a solid ground and white or colored portions at irregular distances. It is the easiest effect to obtain. The skeins which are about one yard long are knotted at the places where the fancy effect is desired. The number of knots vary according to the design to be obtained. In this condition they are dyed by the ordinary method, that part of the yarn in the knot being protected against the action of the dye liquor. After dyeing, the knots are untied. If more than one color effect is desired the skeins are tied and dyed a second time. For example, a skein is tied as already explained. 1. It is immersed in an azo Fuschine bath, the wool being colored red and the knotted parts remaining white. 2. The knots are

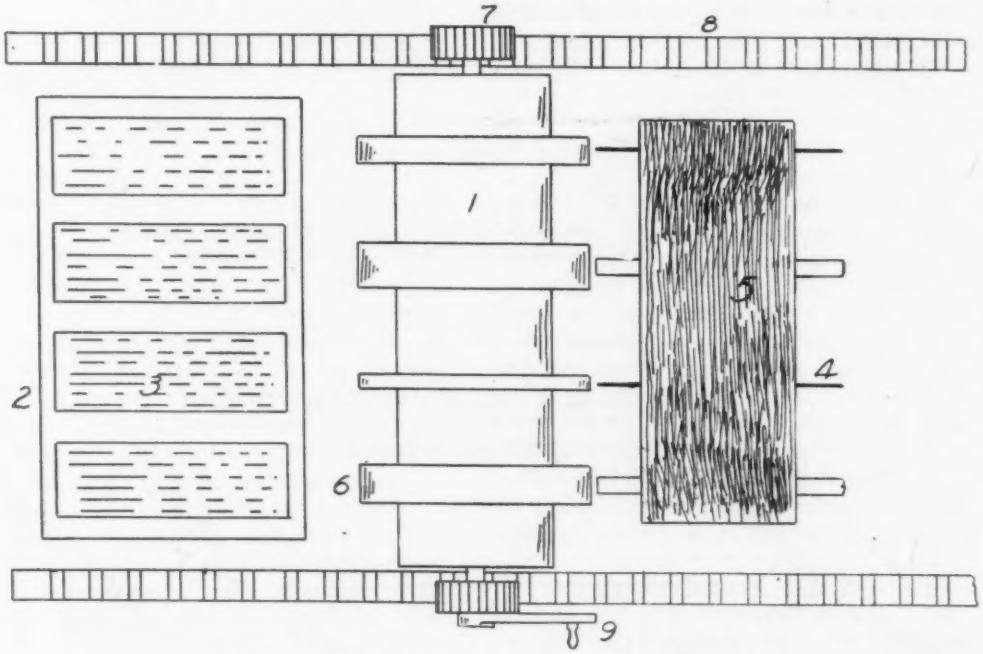


FIG. 2. THE CASTELIN PRINTING MACHINE VIEWED FROM ABOVE.

untied and new knots tied in the red part, the skeins there being immersed in a bath of Orange 2, the ground becoming scarlet, and the parts first knotted becoming orange and the knotted parts a bright red. 3. This operation is repeated by dyeing with Acid Green. The ground work becomes brown; the parts knotted first, green; the parts knotted at the second operation marine blue,

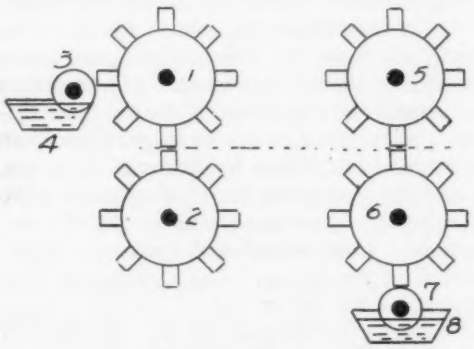


FIG. 3. THE WOOD MACHINE. A SERIES OF ROLLERS COVERED WITH SLATS AND ARRANGED IN PAIRS.

and the parts knotted at the third process being scarlet, orange, yellow or bright red, according to the place where the knots are tied. Thus in three baths at least four colors are obtained.

(c) Dyeing. The skeins are stretched and then tied tightly at intervals with twine to prevent the dye from taking effect at these places. Wooden clamps can be used instead of twine if desired.

B. THE PRINTING PROCESS

These methods are the most practical and the simplest, enabling very fine effects to be produced.

(d) Jasper. These effects consist of very fine lines, usually dark shades on a white or very light ground.

(e) Flame. This effect is similar to that obtained by dyeing. The ground is white or a very light shade and the printed lines are arranged irregularly, showing one or two wide spaces at each side of which are printed a number of fine lines.

(f) Cameo. The ground is dyed a shade similar to the effect shade but of a different depth. This method is carried on in two ways:

1. By first printing and then dyeing. If the skeins are white with dark spaces they can be dyed light shades after printing. If on the contrary the skeins have spaces of a light shade they can be dyed still another shade. On the other hand the skein dyed a light shade then printed with a similar but deeper color can be dyed a third shade which modifies the character of the effect. For example, a skein colored a light orange then printed with a dark orange, is next dyed a light blue, producing a green ground with maroon bars.

2. Stripping on a colored ground. This method is frequently employed. It is used for white bars and effects a marked economy

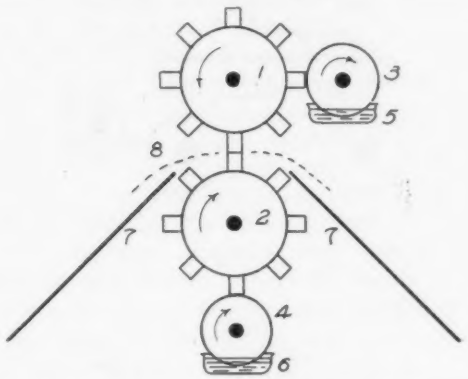


FIG. 4. THE BLONDEL MACHINE. A SERIES OF ROLLERS COVERED WITH SLATS AND ARRANGED IN PAIRS.

in dyestuff. The color is stripped with acetate of tin.

APPARATUS EMPLOYED.

1. Bed for printing. This apparatus is very old but is still used extensively. As shown at Fig. 1, it consists of two thick planks about 28 inches long, 10 inches wide and 5 inches thick. On each side are driven two rows of nails about 3/4 of an inch apart, the second row being set at an angle to the first. The plank, A, forming the cover, is supplied with two handles and cleats, a, in each of which a hole is bored. These holes receive the pegs, b, which hold the plank, A, in position. The plank, B, is fixed on a

table, C, which is equipped with two strong bars, D, on which the plank, A, is placed when required. In making the apparatus ready for use, the wool yarn, E, is stretched on the plank, B, between the nails, being arranged to correspond with the design that is to be obtained. The yarn is tightly stretched because there is a tendency for it to slacken during the printing process. The plank, A, is rubbed with a cloth covered with powdered chalk. Then the yarn on plank, B, is slightly moistened and the cover, A, is applied. Another batch of yarn can in like manner be stretched on the plank, A, enabling two sets of yarn to be dyed at the same time. Each of the planks is coated, first by a brush immersed in printing solution, and then with a cloth nailed on a piece of wood and moistened slightly in the same bath. It is necessary to spread the printing solution uniformly and in sufficient quantity, care being taken to avoid an excess.

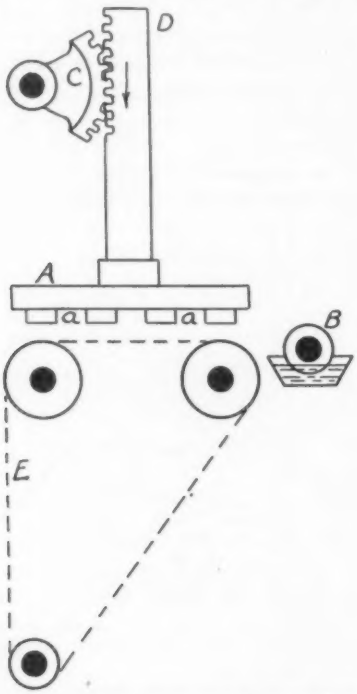


FIG. 5. THE TALON MACHINE, THE PRINCIPLE OF WHICH IS DERIVED FROM THE PRINTING PRESS.

The skeins having been stretched on the plank, B, are covered with the plank, A, and the workman pounds the top plank with a hammer. After the printing process is completed the skeins are moved and dried.

2. The Castelin machine. Although this machine is but little used, I will give a description of it because it enables the skeins to be printed in various shades at one operation. A frame capable of a vertical movement carries a series of small dye receptacles, 3, containing the color. On the same frame are fixed the steel rods, 4, on which the skeins, 5, are stretched. Fig. 2 shows the apparatus viewed from above. The cylinder, 1, carries a series of rings, 6, and can be moved in the frame by means of the gears, 7, and the gear rack, 8. Having carried the cylinder, 1, above the frame, 2, the dye receptacles, 3, are raised and the rings, 6, immersed in the liquor. The cylinder is then carried to the other end of the frame and the printing is effected by the pressure of the skeins between the rings, 6, and the rods, 4. The rings, the rods and the dye receptacles vary in size according to the effect desired.

3. The Wood machine. This machine, shown at Fig. 3, consists of a series of rollers covered with slats and arranged in pairs. The upper roller receives the color from the first pair; the lower roller, for the second pair. This arrangement enables dark shades to be printed twice on the two sides of the skein at the same place. The skeins are printed once for light shades. The printing solutions can be varied so as to give alternating shades if desired.

4. The Blondel machine. This machine, Fig. 4, consists of two printing rolls, one placed above the other. The rollers, 3 and 4, are immersed in the dye liquor in the basins, 5 and 6, and deliver the color to the printing bars. The yarn, 8, passes between the printing rollers to the incline, 7. This machine is sometimes built with a series of these rollers.

5. The Talon machine. This machine, Fig. 5, has been recently introduced, the principle having evidently been derived from the printing press. The effect is produced by the printing bars, a, which are arranged to

produce the particular effect desired. The plate, A, carrying the printing bars is operated by the gear, C, as shown, The plate, A, rests on a carriage which enables it to be moved over the color roller, B, then carried under the pressure bar, D, and pressed against the yarn, which has been tightly stretched over the rolls.

6. The Mahon machine. This is known as the English machine, and is the one generally used. It consists of two engraved cylinders, A and B, Fig. 6. The cylinder, A, is movable and is pressed against the cylinder, B, by means of a screw. The skein is stretched tightly over the rolls, E. The cylinder, A, is turned by a crank which moves the skein so as to make a complete revolution. This process requires specially engraved rolls which costs about $60 a pair.

PREPARATION OF THE YARN.

Wool. Woolen and worsted yarn should first be washed, bleached or treated in a chlorine bath.

Bleaching. The yarn is immersed over night in water heated to 120° F. It is then washed at 110° F. in a bath containing 3 per cent. of carbonate of soda and 4 per cent. of soap. The skeins are next exposed to sulphur for 5 to 6 hours, then rinsed and treated in a chlorine bath. For treating 100 pounds of wool, a bath consisting of 6 parts (by weight) of sulphuric acid (66° B.) to 1,000 parts (by weight) of water is prepared. After handling in this solution for one-quarter of an hour, 12 pounds of hypochlorite of soda standing at 1° B. is added. The yarn is then scoured in a bath containing 6 pounds of concentrated sulphuric acid to 1,000 pounds of water. It is then rinsed to remove the acid and dried at a temperature of 120° F. Instead of bleaching with sulphur, the wool yarn can be bleached with peroxide of sodium. The yarn is prepared as previously described, rinsed in a solution of carbonate of soda and dried. It is then treated for 12 hours in a bath consisting of 6 pounds of peroxide of sodium and 3.8 pounds of sulphuric acid at 66° B. per 1,000 pounds of water. It is then rinsed and dried. By adding a small quantity of glycerine to the rinsing bath the yarn is made more suitable for the printing process.

Cotton. The cotton yarn is boiled out, bleached and occasionally dyed before printing.

Boiling off. The raw yarn is boiled for 3 to 4 hours at a pressure of 1 to 1 1/2 atmosphere, a small quantity of carbonate of soda being added to the bath. No soap nor caustic is used. After boiling off the yarn is thoroughly rinsed.

Bleaching. The yarn is generally bleached with chloride of lime.

Sizing. For colors that run easily, the yarn is sized with a starch solution, free from grease or soap.

Dyeing. Dyeing before printing necessitates certain precautions. No soap or soda is used. Marine salt, sulphate and phosphate of soda are alone admissable. Oil for red and other fatty preparations can be used only for colors that are printed on oiled fibers. The use of sulphate of copper is avoided on steamed colors as the copper attacks the fiber during the steaming process. The basic dyes, mordant colors and colors made insoluble on the fiber are used in the ordinary manner. Usually the two last named groups of dyes require the use of oil of which as little is employed as possible, the excess being removed by an energetic rinsing in hot water.

Silk. Silk yarn is rarely printed in skeins, being generally printed after being warped and by a process similar to that of printing cloth. If the yarn is in skeins it is necessary to boil the silk off in a 30 per cent. solution of Marseille soap. The silk is then rinsed and soured in a 4 per cent. solution of acetic or hydrochloric acid. It is bleached with sulphur or oxygen in an alkaline bath.

Linen. The bleached linen yarn is moistened slightly in an alum solution, the alum being added to prevent the running of the colors. The yarn is then dried by the process used for cotton.

MANIPULATIONS.

The printing process comprises three successive operations: 1, printing; 2, steaming;

3, finishing. The method of handling varies very little for the different textiles.

1. Printing. The printing should be clear and uniform on both sides of the skein, without the running of the colors. The printing of fine effects is best done on the Mahon machine, the Wood machine being used for the larger designs. After printing the yarn is dried at a moderate temperature.

2. Steaming. The dry skeins are suspended in the steaming chamber where they are steamed in order to fix the color. The chamber is similar to that used in connection with vigoureux printing. The chamber has a false bottom covered with a thick bed of straw under which is placed the perforated steam pipe. The chamber should be well ventilated, especially at the beginning of the process, in order to prevent corrosion of the fiber by the acids disengaged during the process. The steaming process lasts for 1 to 2 hours and is carried on without pressure or at a very low pressure.

3. Finishing. For fugitive shades on cotton the skeins are simply shaken out. Many colors require a treatment after steaming to complete the fixing process, such as neutralizing the acid, dissolving the thickening material, or brightening the white. These manipulations include the following:

a. Fixing the antimony. The basic colors printed with tannin are fixed with antimony. The skeins are treated for 1/4 to 1/2 hour at 75° to 120° F. in a bath containing 1 to 5 pounds of the chemical for 1,000 pounds of water. It is then removed from the bath and rinsed well.

b. Neutralizing the acid. The acid liberated by the steaming process is neutralized and the color fixed by treating the yarn in a bath containing 6 to 10 pounds of chalk per 1,000 pounds of water at 140° F.

c. Special treatment. Certain colors, such as aniline black, require a special treatment in a solution of bichromate (3 to 4 per cent.), or carbonate of soda (5 per cent.), or lime.

d. Soaping. Alizarine red is brightened by soaping. This process is also advantageous for other colors.

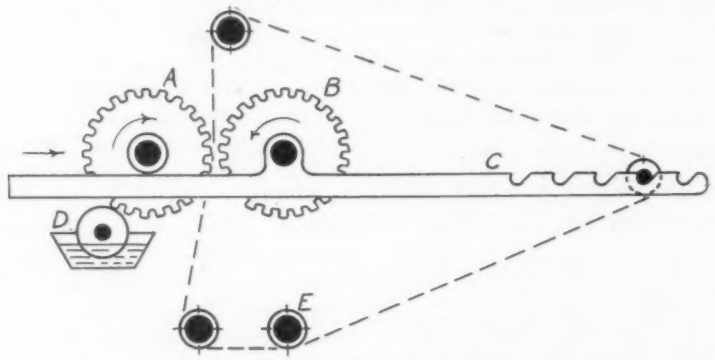


FIG. 6. THE MAHON MACHINE WHICH IS THE ONE IN GENERAL USE.

e. Stripping. The object of this is to remove the thickening material and is used particularly for knitting yarns. The yarn is treated for 1/4 to 1/2 hour at 75° to 120° F. in a bath containing 20 to 50 pounds of malt per 1,000 pounds of water, or 3 to 5 pounds of Diastafor for each 100 pounds of yarn. The material is then well rinsed.

f. Treating with chloride. This process is to brighten the white.

(To be continued.)

The average production of cotton in the United States for the last five years is 11,935,641 bales, or 1,620,259 bales more than the crop of 1909.

The imports of jute into the United States from East India in the last calendar year aggregated for bags, $3,000,000; for burlap, $20,500,000, and for jute fiber, $6,600,000.

ENGLISH NOTES.

(By Our Special English Correspondent.)

The erroneous statement is made in an English dry goods journal that no member of the U. S. Tariff Board has visited any of the English textile centers, upon whose business and costs of production the Board were supposed to be reporting. In case the statement is repeated in America it may be well to contradict it authoritatively now. The Hon. James B. Reynolds on his outward voyage fell in with an old acquaintance on shipboard. When his mission was made known Mr. Reynolds was pressed to come to Bradford, was introduced by his influential friend to a number of manufacturers and was able to collect some very useful information in his stay of three or four days. It is stated that Mr. Reynolds did not call in Manchester, but I learn that he spent some time in Liverpool.

According to information in the American newspapers nothing will be made known of what the Board is ascertaining or attempting to ascertain until full schedules have been prepared for submission to the various industries. It must not surprise American textile manufacturers if they find that the idea of ascertaining the cost of production in foreign countries has been abandoned as impracticable. They may discover that a simpler and more workable scheme has taken its place and that the special agents, who are to be sent abroad to complete the investigations begun by Mr. Reynolds have instructions to ascertain not producers' cost, but sellers' prices. Thus it seems that the difference between the foreign price and the American price for one and the same article is to be the index telling whether or not the tariff on the article in question is or is not too high.

* * *

It is not yet certain that the British Government is going to take special measures for the suppression of sheep-worrying by dogs, but it is at least gathering information. The Chambers of Agriculture have been asked for particulars of farmers who have been driven to discontinue keeping sheep and action will presumably rest on the evidence supplied. The Board of Agriculture, which is the department that has charge of the interests of live stock, is not afraid to be drastic. It caused English dogs to be muzzled for half a dozen years until rabies was eradicated from the country. It causes farmers now to dip their sheep in disinfectant fluid twice annually and obliges them to obtain police certificates proving that this operation has been done. By this means it is hoped to expel sheep-scab ultimately. The ordinance causes a certain amount of trouble to farmers and they are not always grateful for coercion even though it is for their own good.

* * *

American woolen men owe some special interest to a new association formed to prevent them in particular and foreign manufacturers in general from getting hold prematurely of Scotch patterns. The Association has been formed in Galashiels to cooperate with a similar organization in Huddersfield and to obtain the friendly assistance of cloth merchants. The Scotsmen complain of American copying, but it is probable that English, and even Scottish, copying does them more harm. In any case the emergency will hardly be met by resolutions and votes of thanks. Since the world began there has always been a difficulty in keeping secret what is known to more persons than one and this will doubtless continue.

The pattern collectors who issue books of styles on subscription are blamed for disseminating Scotch ideas and as various Border manufacturers subscribe for those books they should know what the books contain. In general, however, the criticism on those volumes is not that they contain too many up-to-the-minute patterns. The exact process whereby Scotch and Yorkshire designers resident abroad obtain accurate information concerning doings in their old homes may or may not be a mystery. As one who has friends designing woolens and worsteds abroad I am free to say that they are usually well informed and sometimes better posted than men on the spot. The de-

signer who had means of information when working at home does not lose all of them by removing abroad.

* * *

In a lecture on colors for cottons Prof. Knecht has been referring dyers to some of the old colors—cutch, iron buff, Prussian blue and manganese bronze—and commenting on the merits of tannic acid as a fixative which gives level results in dyeing light buffs with iron. Old dyers are extracting from their memories of boyhood, recipes for dyeing with copperas and lime-water and such like. Experimentation is going on with vat colors on the one hand and mineral and vegetable colors on the other, because the use of cheap, fugitive dyes and scamped dyeing methods has led to a pass which inexorably demands a change. Prof. Knecht's statement that the confidence of buyers has been badly shaken is fully borne out by inquiries in the trade. Makers of rubber mackintoshes in particular are understood to have set down their foot and determined to have faster shades. The difficulties of dyers of these fabrics are not decreased by the fact that low prices are paid and low cloths used. Paramattas with a light worsted filling and a cotton warp are much used and warp and filling have to be piece-dyed to one shade. Large numbers of shades sometimes with small quantities to each are wanted and dyers doing much of this work have found it politic to install small machines taking two pieces, and arrange them so that three or four machines can be supervised by one man.

* * *

A special committee of the Bradford Chamber of Commerce, formed to recommend a standard of percentage of oil in tops, has named 3 1/2 per cent. of gross fatty matter in the oil-combed article and .634 per cent. in the case of dry-combed tops. The limits have not met with the favor of topmakers who have something to lose by the adoption of too narrow a margin; although on the evidence of the conditioning house management 3 1/2 per cent. gross is the general average of the trade. The spinning and topmaking sections of the Chamber are arguing out their differences and standard proportions will doubtless be arrived at soon. The quota of water is standardized already, but there is no whisper as to standardizing trade qualities of tops or of fixing their nomenclature according to the length to which they will spin. We still have "forties" which cannot be spun beyond 32s. On the other hand we have "eighties" which spin 100 hanks to the pound.

* * *

The line stripes set fairly close together and yarn-dyed to a lighter tone than their background, which are the next year's fashion in worsted suitings, are being adopted also for overcoats. The raincoat firms are all taking up these styles and in a few cases the lines are varied with slubs. The slubs or knickers are presumably a contagion caught from the dress tweed trade in which knicker styles are being worked to death by the cheap makers. Manufacturers of the more expensive dress tweeds are accordingly chary of fancy yarns, although they are employing some extreme fancies in spirals and loops. The Scotch mills are again using some tinsel yarn. Tinsel plate, presumably under the influence of the copper market, has advanced in price. In general colorings there is a pronounced preference for browns and blues.

* * *

The sponsor of the new scheme for spending $15,000,000 in irrigating 500,000 to a million acres in the Soudan and for eventually raising 700,000 bales of Egyptian cotton a year is Sir William Mather of the machinery firm of Mather & Platt, Ltd. He has for prompter a great civil engineer, Sir William Garstin, and for experience an extensive acquaintance with the Soudan and his interest in the Zeidah Syndicate. The latter body raises cotton rather better than fully-good-fair Egyptian on 1,400 acres of Blue Nile territory and produced last year 400 pounds of ginned cotton per acre cropped. The Syndicate proposes on its own account to irrigate 120,000 acres extending along 160 miles of this arm of the Nile and by cropping cotton every third year expects ultimately to

raise 26,000 bales. The larger scheme for which the millions are wanted contemplates the irrigation of the plain of Gezira lying between the White and Blue Niles in a triangle southwards from Khartoum. The half million acres mentioned is only one-sixth to one-eighth of the available area and is taken for a beginning. This area is reported free from cotton pests and nearly free from weeds. On the whole it seems wonderful that so little had been heard hitherto of what is now declared to be so favorable a spot. On the other hand the authors of the scheme are not without reputation and a sense of responsibility and their names lend it weight. The affair is too large to win an immediate assent, but it can be taken for certain that all its points will be investigated. The Government is to be invited to support the financing of the working of the plain and if the facts are confirmed the finding of funds will present no obstacle.

The Soudanese plan issues under the auspices of the British Cotton Growing Association and has only to develop to throw that body's laborious attempts to grow a few dozen extra bales in the smaller British dependencies completely into the shade. At this rate one may anticipate that the Association will soon be busier with the Soudan and India than with its retail business in the lower parts of Africa. It is of course manifest that the making of a $15,000,000 canal and barrage will occupy a certain length of time after the completion of the preliminary formalities enabling the capital to be raised. It is apparent that the cultivation of hundreds of thousands of bales calls for a large number of cultivators and at present the area is "not densely populated" as Sir William Mather puts it.

* * *

Side shows in connection with mills have their disadvantages. When a mill acquires a brass band and the band becomes famous and enters competitions there is a temptation to engage men who are handier with a trombone than with a loom and they cannot both tour with the band and carry on in the mill. Similarly with the football and athletic clubs; the help is recruited with one eye on the sporting prowess of the men. If a Leeds example spreads even weavers and twisters may be examined for their dramatic talents. The mill has an amateur dramatic society with the temerity to put Shakespeare on its stage. The attempt has been favorably regarded by the critics and it has at least served the purpose of interesting and amusing the folk at Springfield Mills, Farsley, which is really all that the company desired to do.

* * *

The report that the Bradford Dyers' Association is to start works in America has been promptly coupled with surmises that the directors are after the business in fast black mercerized cotton linings. The Association is the chief English dyer of these goods and its American business has suffered from tariff revision. The B. D. A. has followed a bold advertising policy and many of its branded finishes are known throughout the world. "Marquise" for cotton venetians and "Kirk's Permanent" for cotton Italians are among the best known of its marks. "Permo" for mohairs, etc., "Pirle" for preventing spotting and cockling in woolen and worsted dress goods and "Cravenette" are others of its lines.

The Association makes no textiles to speak of except buntings and sells none except silks, book-cloths and job goods spoiled in dyeing. It has a share capital of $25,000,000 and debenture capital of $7,000,000 and was formed in 1898 to take over nearly all the stuff and lining dye works in Yorkshire. It has one large slubbing and yarn dyeing branch and owns in all about forty works in Yorkshire, Lancashire and Cheshire devoted to piece-dyeing. It has an understanding with the Bleachers' and the Calico Printers' Associations, confining each of them to their own lines of trade.

The B. D. A. has followed a policy of specialization from its beginning and although some of its outlays in extension and reorganization may have been rash the financial results have been signally good. It is indeed the only shining success among finishing

trade combinations. The Association retains a first-class staff of chemists, has its own architects and engineers and owns a chemical works at which many of the sundries of the business are manufactured. The supreme power has always vested in few hands and retirements have left the headship with George Douglas, who was lately in America in connection with the proposed extension. He has an executive of half a dozen and a large general board. The central buying department purchases most of the supplies for the branches.

NEW COTTON MILLS AND THE PRICE OF COTTON.

Previous to 1905 the European cotton trade had viewed the business of growing cotton and manufacturing cotton goods, with the perspective inverted. They naturally had been trained to look upon the spinning, weaving, finishing and selling of cotton goods as the chief part of the business, this idea being the result of their having no contact with the growing of cotton. The cotton shortage and resulting short time in 1904 make them realize that something was wrong, and they jumped to the conclusion that speculation was the principal cause of their difficulties. In 1905, however, it was pointed out to the European trade that the underlying cause of the business disturbance was a disposition between demand and supply brought about not only by a short supply of cotton, but also by an excessive increase in the number of cotton spindles throughout the world. Since that time this opinion has steadily forced itself on the attention of the European cotton trade until now we find the clearest statements of it coming from European sources. For example, Arthur Kuffler, of Vienna, Austria, who will be remembered by many of our readers as having visited this country on the cotton excursion in 1907, made the following statement recently in the "Neue Freie Presse":

The price of raw cotton has advanced about 50 per cent. during the past season. This has been caused by a wholly unnecessary increase in the number of spinning and weaving mills. The number of cotton spindles has been increased about 25 per cent. during this period, the increase being distributed among all the different manufacturing countries. The attempt to keep all these mills in operation at a time when the supply of raw material remained stationary necessarily caused an advance in the price of cotton, and with which the price of goods did not keep pace.

The starting of the new spinning mills has created an artificial scarcity of cotton and at the same time a surplus of cotton goods. When the trade recognized the existence of these conditions an attempt was made to remedy the difficulty by a more or less effective reduction of the running time, and it is during this period of short time that an improvement in business conditions is to be found. The cotton spinners of Austria reduced their production of goods about 25 per cent. from the middle of 1909 to the present time and thus prevented a further increase in the stock of goods on hand. The cotton trade must reconcile itself to the fact that it will not be in a position in the immediate future to dispose of the full production of the mills and obtain raw material for such production at a suitable price.

The only feasible method is to make the production correspond with the consumption of goods on the one hand and with the supply of raw material on the other. A remarkable result or accompaniment of the reduction in running time has been, not an increase, but a decline in the price of goods. If the cotton spinners will make their requirements suit the size of the cotton crop it will not be possible for the American interests to put the price of cotton up to a level where the European trade will be compelled to pay a tribute of many millions to the Americans. This view is accepted even in America. Twelve million spindles in the Southern States have reduced their production from 60 to 65 per cent., while the mills with 15,000,000 spindles in the North have cut down their running time from 50 to 60 per cent. In spite of the fact that there is no accumulation of finished goods the American mills are to run on short time until the size of the new cotton crop is known and until it is possible to obtain a price for goods commensurate with the cost of the raw material. In England, the chief cotton manufacturing country of the world, the spinners are working only four days a week. If the trade persists in this sensible course, and if we have large crops of cereals and a reduction in the cost of living, the business conditions in the cotton industry will certainly improve.

It is a mistake to hold American cotton speculators responsible for the present deplorable conditions in the trade. The real responsibility rests on the manufacturers themselves, who by running their mills to the full capacity caused an artificial scarcity of cotton which enabled Patten and his kind to gain a position where they were able to influence the entire cotton trade of the world for good or for ill.

Cotton is imported into Greece annually to the amount of 8,000 to 10,000 bales.

AN IMPROVED BURR CRUSHING APPARATUS.

BY JOHN BROWN.

Of all the contrivances which have been tried for separating and clearing away the "burrs" and seeds that are so numerous in some classes of wool, none have proved so simple and efficient as the passing of the fibers, when in flake or sheet form, through heavily weighted steel rollers. When accurately turned and set the rollers crush and disintegrate the burrs so that the greater portion of them fall to the ground during the subsequent working of the stock. Changing from "burry" to clear wool requires considerable labor and results in loss of time. This is the case especially where burr rollers are fixed in the middle as well as at the sides of the card.

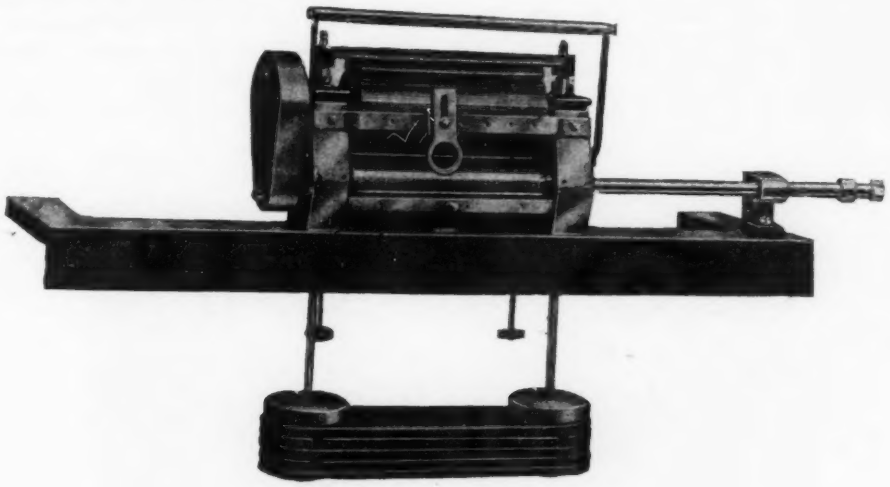


FIG. 1.

This difficulty has been overcome by an English invention, Fig. 1, by which the rollers of the burr crushing apparatus are brought into or out of operation more expeditiously and with less liability of sliver breakage, than is the case with the ordinary burr brushing contrivances.

FIG. 2.

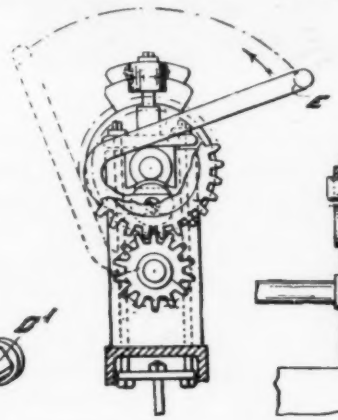
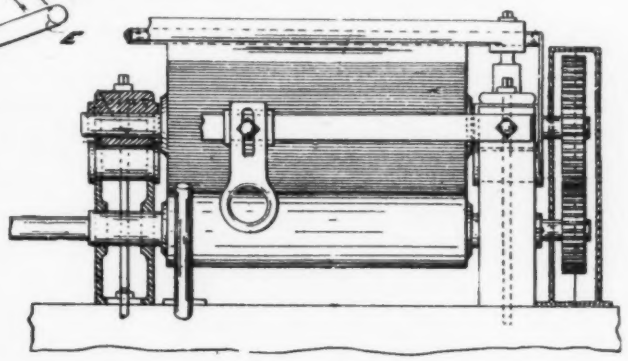


FIG. 3.



F.G. 4.

The raising or lowering is effected by a cam, D, Fig. 2, which has a flat face, D^1, and fits under the bearing of the top roller. When the flat face is at the top the rollers are in contact and set for burr crushing. By simply pulling the lever, L, Fig. 3, the round part, coming in contact with the bearing, raises the top roller and weights, thus leaving a clear space for the wool to pass through when clear wool is being carded. A bar, E, Fig. 3, passes across the width of the rollers, connecting the levers at each end, so that the roller is lifted evenly at one operation. As the weights are suspended from the bearers, and not on the necks of the rollers, there is no wear on the arbors, when burring is not being done. Deep toothed wheels are substituted for friction discs and thus a positive drive is obtained at all times, as the gears remain constantly in mesh. Fig. 4 is a front view of the device. The burr crushing apparatus fixed in the middle of the card is the same except that the length of the rollers is equal to the width of the card.

During 1909 Russia imported 405,440,000 pounds of raw cotton, valued at $50,026,585.

BRANDING BALES OF WOOL.

FROM DALGETY'S REVIEW.

The attention of wool growers is drawn to the two accompanying illustrations of the branding of bales of wool. They are from photographs of wool in store, and are reproduced for the purpose of showing the boldness of the brands, with quality marks, in the one case, and the indistinctness of the brands on the bales in the other.

In the branding of bales of wool large, bold lettering is desirable. There should be the station brand, with the initials of the owner over it, as well as the number, both on the front of the bale and on the cap of the bale. If this is done in large lettering the clip of every owner is as easily distinguished after the bales have been dumped for shipment as when each bale was in store.

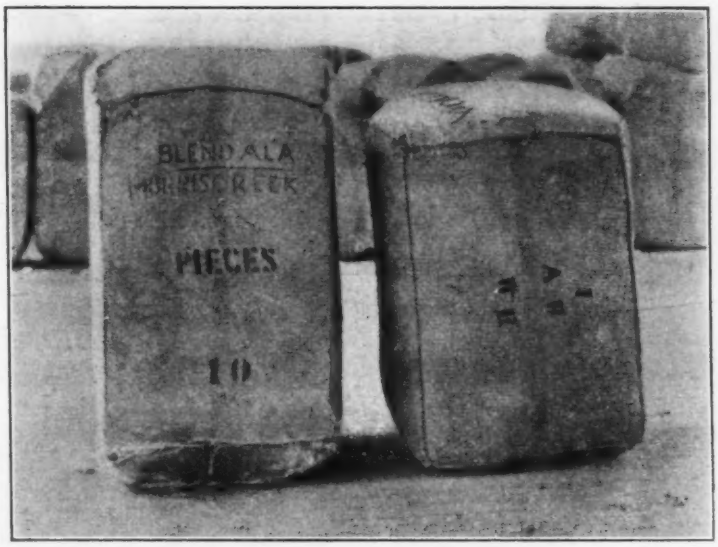
EXAMPLES OF EFFECTIVE BRANDING.

Modesty in branding bales of wool is to be discouraged, for when some hundreds of thousands have to be dealt with in a season it is most desirable that each bale of every clip should be distinguishable at a glance. First, there is the station brand, and then the quality of the wool (fleece, 1st pieces, bellies, locks, etc.), and then the number.

As some stations or farms may be of the same name, such as Rosebank, it is desirable that the grower's initials be placed over it and form part of the brand, as follows:

T C
ROSEBANK
1ST PIECES
41

J K
ROSEBANK
1ST PIECES
41



SMALL LETTER BRANDING WHICH IS NOT RECOMMENDED.

If every wool grower who has previously branded his bales with small stencil lettering will adopt a large, bold type of letter, as used on "Lue" or "Erambie," the receiving, storing, showing, dumping and general handling and selling of each owner's wool will be facilitated. There will be no danger of one brand being mistaken for another, and no room for error through indistinctness of marks.

The imports of cotton into Havre, France, for 1909 were 1,151,253 bales of American cotton, 28,082 bales of Brazilian, and 20,113 of East Indian.

FIRE TESTS FOR TEXTILES.

BY WESSEX.

A system for fire-testing textiles which is used and approved by the British Fire Prevention Committee seems to deserve general attention. Numerous deaths from the flaming of flannelette, curtains and decorative hangings tend to bring the matter of safety against conflagration to the front. The committee, be it explained, is a voluntary association of twelve years' standing having for its principal object the protection of life and property against fire. It numbers eminent engineers, architects, scientists, insurance managers and Government officials among its members and holds meetings, prepares reports and makes investigations at its private testing station. This committee has formulated a standard test for the inflammability of such fabrics as flannelettes and has laid down the conditions under which it certifies fabrics as non-flaming. These specifications follow:

(a) Three samples comprising each (about) one square yard of the material to be tested shall be washed with soap and ironed ten times.

(b) The samples shall be ironed once (in addi-

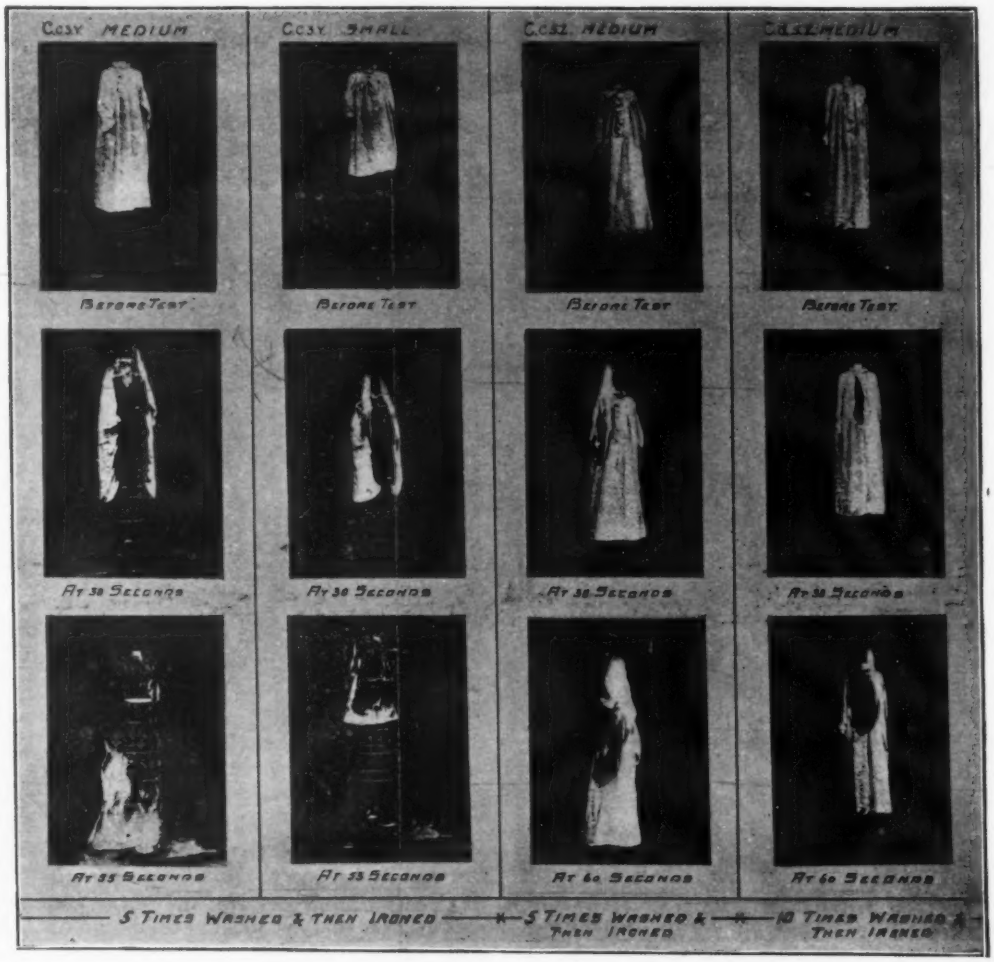
tion) with an ordinary household iron within three hours, but not less than one hour before the test and shall be dry to the touch immediately before testing.

(c) The samples thus prepared shall be measured exactly and their areas shall not vary more than 10 per cent. above or below a square yard.

material shall be classified as "non-flaming."

Note.—Should more than 5 per cent. but less than 25 per cent. burn within sixty seconds the definition "Flames readily" might be applied, but if more than 25 per cent. burns the definition "Burns rapidly" might be applied.

Note.—Where the treatment is not intended to



(d) The samples shall be suspended in rotation from a wooden lath, vertically, by three tacks, clips or other metal fastenings.

(e) Fire shall be applied at the center of the bottom edge from a taper 1/8 in. diameter, not more than 12 in. or less than 6 in. long.

(f) The lighted end of the taper shall be held at the edge for not less than fifteen seconds or more than thirty seconds.

(g) If not more than 5 per cent. of the area actually under test burns within sixty seconds when taken on the average of three samples, the

withstand washings, but requires renewal after every washing the same test should be applied, but no washings or ironings under (a) would be required and the classification would only have bearing upon the efficiency of the individual treatment and not upon its capacity to withstand washing.

The specification is not unimpeachable for among the salts used in fireproofing may be some that are more readily removed in water

than in a soap solution containing fats with which the chemicals may unite. The requirement that the cloth shall be "dry to the touch immediately before testing" is not incompatible with material differences in the amount of moisture present in the sample. Exact timing of the number of seconds in which the sample is in contact with fire is obviously desirable, but crude methods of making and destroying contact are not exact. Whether these loopholes are important or not it is as well that they should be recognized.

In an actual test of inflammability conducted at the committees' experimental station in London the weather conditions were carefully recorded on each day. The direction of the wind, barometrical pressure, thermometrical reading and wet and dry bulb readings, as well as a cloud observation, were duly taken. The yard samples were suspended, some in straight lengths, some pleated and some hung from one corner; some were fired with a taper, some with a spirit lamp, all results being categorically recorded. A certain number of garments were put under test and were dressed for this purpose over wire frames after the waists and necks of the frames had been choked with wood in order to prevent an internal draught such as would not occur in practice. Photographs were taken of what remained after sixty seconds' combustion and some of these, given here, illustrate the methods followed in making a research into the comparative inflammability of various flannelettes and flannels. From the measurements of the cloth remaining after each test diagrams were also prepared and these accompany exhaustive tables of results arranged in this manner:

LOG OF TESTS.

Refce. No.	At what Laundry Washed	Condition and Number of Washings	How Placed For Testing	Means of Producing Flame	Length of Time in Contact With Flame	Duration of Test	Area of Sample Burnt Sq. In.	Amount Per Cent Burnt	Remarks

With a little perseverance any experimenter can compile his own results in a similar manner. The photographs summarize the committee's findings in the London tests as closely as a short note can do. But for any interest the details of the specific case may have, be it said that the committee were reporting on 456 samples belonging to six groups. Group A represents a flannelette called "Non-Flam Commercial," i. e., flannelette which has been steeped in a solution of stannate of soda at 42° Tw., squeezed, dried and then passed through ammonium sulphate at 140° Tw.; being finally squeezed, dried, washed in running water and squeezed again. Group B represents a flannelette "Non-Flam Special" treated similarly, but with solutions 20 per cent. stronger. Group C consists of the same flannelettes not treated against fire. Group D is composed of union flannels containing 23 to 52 per cent. of woolen fiber. Group E represents an all-wool flannel and F fine finish flannelettes, finely spun, closely woven and evenly napped. The samples were collected from named sources by the parties interested in the "Non-Flam" patent process and the tests were made by independent persons in the presence of witnesses and representatives of the "Non-Flam" firm.

In Group A not more than 2 per cent. of any sample was burnt away to which a taper had been applied and not more than 4 per cent. by the spirit lamp.

In Group B not more than .6 per cent. was burnt away by taper and not more than 2 per cent. of any samples by spirit flame.

In Group C (untreated) an average of 33 per cent. of the unwashed samples and an average of 97 per cent. of the washed samples was consumed in sixty seconds.

In Group D (union flannel) 35 per cent. of the unwashed and 50 per cent. of the washed samples was burnt away on the average in sixty seconds.

In Group E (wool flannel) with the exception of one sample not more than 1 per cent. was burnt by application of the taper and not more than 2 per cent. by the spirit lamp.

In Group F (fine flannelette) an average of 27 per cent. of the unwashed and 80 per cent. of the washed samples was consumed in sixty seconds.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

Crutching and Crutchings.

Editor Textile World Record:

An article, "Wool Growing in New Zealand," in your September issue contains this passage: "The sheep were worked only twice a year, at crutching and shearing time." Please explain what the word "crutching" means. Valley (1248).

"Valley's" ignorance seems to be thoroughly excusable. Many wool dealers know "crutchings" when they see them without being able to give more than a guess at their origin or at the meaning of the term "crutching time." Large quantities of "crutchings" now arrive in England from Australia and are sold to the carded woolen trade. Of the various guesses made I enumerate a few. One thought they might be rubbings from fleeces. Another, who defined them as "short pieces, larger than locks," thought the name might have some connection with the crook (or crutch) with which the shepherd is traditionally associated. A friend who spent many years sheep farming in New Zealand supplies what may be called an authoritative explanation. "Crutching time" occurs about two months before shearing. The animals are rounded up in an enclosure and the sheep are gone over with shears. The locks removed from the breech are known as "daggings" and those from the back as "crutchings." The operation is commonly called "dagging and crutching," and men are paid about 84 cents per hundred sheep for doing the work. A reasonably competent hand can deal with about three hundred sheep a day. The work is done partly for the purpose of simplifying the full shearing that is done later in the year. It blunts shears very much to clip through the dirt and hard stuff which accumulates on the coats of the animals and many farmers hold that the fleece grows better for the removal of all this clogged matter. At the same time there are some growers who refuse to go to the trouble.

Regent.

Carbonizing Wool.

Editor Textile World Record:

We have been in the habit of using wool more or less burry as we have no means of getting rid of the burrs before sending the stock to the cards, the wool being put to the cards with the burrs in and the result is that the card clothing is in bad shape. I have been considering introducing a burr picker, but am in doubt whether it would do the work as well as carbonizing. For that reason I would like to see some good articles on carbonizing, giving full instructions as to how it could and should be done and the probable cost and equipment for a carbonizing plant, that would handle about 500 pounds of wool a day.

Buxton (1244).

Carbonizing is by far the most satisfactory method of removing burrs from wool, unless the burrs are very large or are what is known as "hard" burrs. These may be all knocked out of the wool by burr picking which will leave the stock in better condition than by the carbonizing process, as the latter has a tendency to weaken the wool. To carbonize the wool for hard burrs the vat should be filled with cold water and enough sulphuric acid added to bring the bath up to about 6° Tw.

After the bath is brought up to the required strength the scoured wool is entered and allowed to soak for about three hours and then forked out, drained and thoroughly extracted. The wool may be put into the acid bath either wet or dry, but in putting in the dry stock more liquor is absorbed and consequently when it is taken out more water has to be added, which weakens the bath, and, of course, more acid is required to

bring it back to its former strength. This is an essential point as the bath should not be allowed to run down if the stock is to be carbonized thoroughly.

The next step in carbonizing is the drying and baking process, which can be done either on the old fashioned table dryers or in the Stone dryer manufactured by the James Hunter Machine Co., or the Sargent carbonizing plant. If the table dryer is used a set of heavy crush rollers and a cone duster would have to be installed in order to crush the burrs and free the wool from the dust and pieces of burrs which cling to the stock.

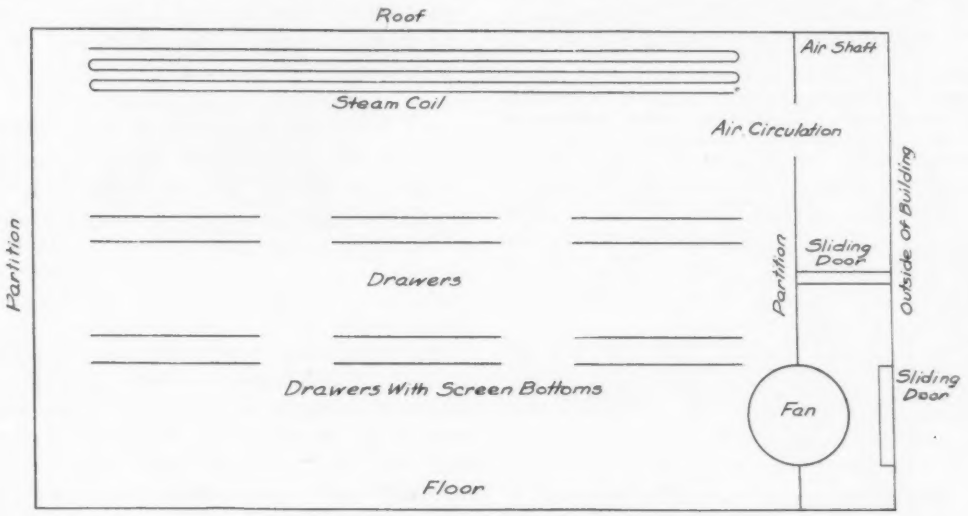


FIG. 1. THE TABLE OR DRAWER DRYER.

If the table or drawer dryer, Fig. 1, is used, the stock must be spread out evenly and not too thick on these drawers, and the fan should be started, the sliding door in the air shaft closed, and the sliding door in the outside of the building opened. In this way the stock should be dried considerably as the cold, damp air is driven outside. The fan should be left running about two hours, the steam then turned on, the outside sliding door closed and the sliding door in the air shaft opened. There should be enough piping in the coil so that the drying room can be heated to a temperature of at least 220° F. The fan if kept running all this time will give a good circulation. The wool should be turned over once in a while so that it will dry thoroughly, and should not be taken off the dryer until the burrs are well baked. when they will turn black and can be crumbled up between thumb and finger. The stock should then be passed through heavy crush rollers and a cone duster, and then neutralized. In neutralizing the stock enough alkali and soap should be used to remove the acid, or to have the stock smell sweet. If too much alkali is used it turns the stock yellow and makes it harsh. In building the table or drawer dryer as many drawers can be put in as is required. One dry room with about 5 drawers, 3 by 3 feet square, makes a pretty fair room to heat, and of course, the fan should be in proportion to the size of the room built.

Tambura.

Percentage of Cotton in Merino Yarn.

Editor Textile World Record:

How can I determine accurately the percentage of cotton or wool in merino yarn?

Rexford (1242).

The percentage of cotton in merino yarn is determined in the following manner: Weigh a fair sized sample of the yarn, then sew it up in a small cheesecloth bag and boil the sample for 15 minutes in a 10 per cent.

solution of caustic potash. Rinse the sample well, then squeeze out the surplus water by wringing in a cloth. What is left of the sample after this treatment is cotton, which should be exposed to the open air until dry and then weighed. A comparison of the weight before the treatment with the weight afterwards will indicate the percentage of cotton in the yarn. Ex. A sample of merino yarn weighs 20 grains before boiling out, and 7 grains afterwards, find the percentage of cotton. $7 \div 20 = 35$ per cent. cotton.

Equipment of a Throwing Plant.

Editor Textile World Record:

We would like to put in a small throwing plant and would like to know how many machines it would require to throw about 100 lbs. of tram per week. Also the probable cost. The size tram we wish to throw is 8 thds. Willard (1247).

As a basis to work from we will assume that the mill is run 55 hours per week, that the stock used is 13/15 denier No. 1 Japan filature, or equal, and that the twist he desires is 2 1/2 turns per inch.

The processes through which the silk will pass will be soaking, wringing-out, drying, winding, doubling, spinning (twisting), reeling, inspecting and bundling.

The number of spinning spindles required will be figured as follows: Speed 5,600 r. p. m. $\times$ 3,300 minutes per week = 18,480,000 revolutions per week per spindle. The size of 13/15 denier silk may average about 14.20 deniers. The yardage per pound of 1 denier silk, 4,464,528 $\div$ 14.20 = 314,403 yards, and this doubled into 8 threads becomes 39,300 yards per pound. As a shortening of probably 2 1/2 per cent. in twisting will take place this is further reduced to 38,320 yards.

To this, 2 1/2 turns of twist per inch, equal to 90 turns per yard, are given, a total number of turns of twist in the pound of 3,448,800.

Then divide the 18,484,000 revolutions per week per spindle by the 3,448,800 turns of twist in one pound and we have a theoretical weekly production per spindle of 5.36 pounds. If a 20 per cent. allowance is made for time spent in doffing and piecing-up we have an actual weekly production of 4.39 pounds per spindle. Dividing 100 pounds by this gives 23 as the necessary number of spindles.

Without going into these details for the other processes it will suffice to say that the calculations require 107 winder spindles, 21 high-speed doubler spindles, and 5 reeling spindles.

It would be judicious to get a rather larger equipment than the bare minimum, and I would thereupon recommend a lay-out about as follows:

150 winder spindles	$2.25 =	$337.50
30 doubler spindler	$4.25 =	127.50
30 tram spinning spindles,	$3.00 =	90.00
12 reeling spindles	$3.25 =	39.00
Total		$594.00

It may be that in such small machines the prices per spindle may be higher. High-speed, upright doublers are usually arranged to double only four ends at once, but by running two ends of the four-thread together an eight-thread is got, and the doubling on these frames is both fast and good.

The following appliances will also be needed: A soaking tub, wringer and drying chamber; a supply of bobbins, say 200 iron-head at about 10 cents, and 1,000 to 1,500 fiber-head, for winders and doublers, at about 8 cents; 1 1/2 inch spindle-belt for spinner at about 18 cents a foot; a bundling press, but if the silk is not to be bundled it can be omitted; stretching poles for winders, and some doubler-caps, reel-caps and flyers. The swifts with their bands and weights, and the spindles are included in the price of the winding machines. Boxes for carrying bobbins, a soap cutter, scales and an oil tank and measures will be required. There must also be some stock of olive-oil and olive-oil soap kept on hand.

Then there is the transmission equipment, shafting, belting, etc., and perhaps a motor to drive it. The power needed would be very small—probably not over 2 h. p.

Perhaps $250,00 might cover the accessories, and with $50.00 for the transmission equipment, $100.00 for a motor and $600.00 for the machinery there is a total investment of about $1.000.00.

James Chittick.

Woolen Nubs.

Editor Textile World Record:

Can you give us the names of concerns who make and sell woolen nubs, similar to those shown in illustration? We would also like to have some information regarding the manufacture of these nubs and how they are put into the yarn without carding out. Saxon (1245).

We do not know of any concerns that make woolen nubs to sell. There is a machine made for distributing nubs through the stock, which is attached directly over the last

WOOLEN NUBS.

worker on the finishing card, distributing the nubs according to the amount required. This machine is used in preference to mixing nubs in the stock, because it drops the nubs automatically into the card and the yarn comes out in better condition, and second because it is less trouble, for in order to let the nubs go through without carding, the workers would have to be set off from the cylinder of the card, and uneven yarn would be the result.

To make nubs like those illustrated, without this attachment, prepare the wool in the usual way and run the lot through the first breaker only, but before doing this set the workers off from the cylinder so that the stock will roll up instead of carding out. Stop the comb and fasten it so as to be in the center of the doffer. When the stock comes to the comb it will drop to the floor. Collect the nubs and place them in a bag tightly fastened. Have them well soaped and fulled, and after rinsing, dye without removing from the bag.

Mix the nubs in the regular batch of stock according to the per cent. you wish to put in. The three breakers will then have to be adjusted so that the nubs will not card out, that is, the workers will have to be set off from the cylinder. This process is not apt to give the good results as the one before mentioned. Greenwich.

Colored Camel Hair.

Editor Textile World Record:

We were much interested in reading your article on camel hair in a recent issue of the Textile World Record. We have been for some time contemplating bringing out a line of goods made from camel hair and other grades of hair. Your reference to Indian camel hair ranging in color from black to white, also including cream and mouse color attracted our attention and we would appreciate having you advise us what dealer in England would be most likely to have these various colors on hand, especially the cream and mouse colors. Layton (1239).

Our Bradford correspondent replies as follows:

The inquiry has been shown to various well-informed people and it is clear that Indian camel hair is unknown to the largest and oldest camel hair topmakers in Bradford. They have simply light brown and dark brown qualities and can only suggest gilling the light brown with some white material to obtain a natural mixture of a cream shade.

Helmuth Schwarze & Co., London, who handle various kinds of camel hair, point out that the cream and mouse colored material inquired for do not occur in clearly pronounced tints and suggest that the matter would have to be met by dyeing.

The inquirer does not say whether short or long material is wanted and gives no clue to the kind of goods he proposes to make. His reference to "other grades of hair" suggests that he might employ cashmere unless the extra price prohibits that fiber. Cashmere at present is rather dear, but it might be possible to get some in the desired colors. H. Haigh & Co., Hollings Mill, Bradford, will be glad to give attention to any inquiries if "Layton" will specify his wants more closely. They are blenders of cashmere wastes and other materials. Another dealer in camel and cashmere noils is William Root, Bath St., Bradford. Regent.

Gloss on Curtains.

Editor Textile World Record:

I want to get a high gloss on lace curtains and in particular desire to know how to boil the starch so that it will be thin and strong.

Curtain (1233).

The addition of dextrine to starch enables a given quantity of water to take up much more starch without thickening. "Curtain" might try this and if commercial dextrin is too brown in color let him buy white (i. e., bleached) dextrin and note the result.

A well informed man advises the use of white dextrin without any starch; the dextrin to be boiled for forty minutes before use. The clear, limpid gum will possibly answer all requirements and it does not mildew.

The laundries use a good deal of paraffin wax in emulsion with starch. The wax is stirred in and the mixture is maintained at a temperature higher than the melting point of the sample of wax used. Failing this precaution the wax separates. Borax (sodium borate) is also used in conjunction with starch to get a high finish in calendering and from these ingredients "Curtain" should be able to get a result to suit him. Wessex.

Trouble with Sizing Warps.

Editor Textile World Record:

How can we overcome the trouble we are having with our sizing? We are making 96 by 100 40 inch, 5 yard goods, about 50s warp and 52s filling, on the E model Draper loom with single bank drop wire motion. We cannot get the warps sized heavy enough to prevent chafing and little balls forming between the harness and reed, without having the size so heavy on the slasher that the yarn breaks at the split rods. We also have trouble with our sizing falling off around the slasher and under the loom. We think this is due to the fact that our yarn is sized very heavy.

Slasher (1232).

Evidently the size is not "cooked" sufficiently to enable it to penetrate the yarn. The size remains on the outside of the yarn, is easily rubbed off and drops on the floor. With a cloth construction such as is given, there ought to be no trouble with the size providing it is made all right. Much depends on the proper mixing of the different ingredients, and the proportions of the same, as it is obvious that what will give good results on one class of goods will not give satisfaction on a different grade of cloth. "Slasher" does not state how his size is made, so it is impossible to say whether it is calculated to give good results. I would recommend the following:

120 lbs. starch
100 gals. water
5 lbs. bone grease
3 lbs. British gum
1 pt. turpentine
1 cake of wax.

These should be boiled one hour, and then kept simmering in the size vats. The yarn must be thoroughly dried as it goes over the cylinder. Publico.

Causes of Tender Yarn.

Editor Textile World Record:

Please state the causes of tender yarn manufactured from 1 1/8 inch cotton under the following conditions: We are running through the bale breaker, single beater breaker, intermediate and finisher pickers, revolving top flat cards, three processes of drawing and slubbers, intermediate and fine speeders, with double roving in spinning

Miami (1241).

Had the counts of yarn been stated, it would have been possible to give a clearer answer. As is very well known the counts to be spun will determine largely the kind of cotton to use, both as regards grade and length of staple. In the above case part of the trouble, and perhaps the chief trouble, may be caused by the kind of cotton used. It may be a trifle too short, or of rather too low a grade, or it may be what is termed "waste" cotton, meaning that it contains too large a proportion of short and weak fiber.

Assuming that the weakness is not caused by the raw cotton itself, there are numerous other causes that may have a tendency to produce weak yarn. The blades of the beaters in the several picking processes may be set too close to the feed rolls, or the beater blades may be worn on the striking edges, causing them to crush or rupture the fibers by giving them a dull, heavy blow, instead of a quick, clean blow, which would strike off the cotton. The treatment which the cotton receives in the picking processes is of more importance than is generally sup-

posed, as much damage can be done to good stock at this point. Possibly the beaters may be revolving at too high a speed, giving the cotton more blows per inch than is really needed, resulting in broken fibers, which will weaken the yarn. The twist put into the yarn would also affect its strength, but this would be determined by the counts, and also its intended use, whether for warp, filling or hosiery.

Using excessive drafts at one or more points in the preparation processes will cause weak yarn. Anything which tends to strain the yarn and destroy some of its elasticity would have the same effect. Using a heavier traveler than is needed, rings and spindles not being set concentric, or thread guides improperly set would all aggravate the evil by destroying the elasticity of the yarn.

I cannot tell from "Miami's" inquiry whether the yarn is spooled and beamed. Yarn is frequently injured in these operations by using excessive spindle speed on the spooler, or running the warper at too high speed, or using very large spools in the warper creel, the pulling around of which tends to strain the yarn and helps to destroy the elastic qualities. Forfar.

Bleaching Tape.

Editor Textile World Record:

We have difficulty in sizing our bleached yarns. They turn yellow, as shown by the enclosed samples. Can you inform us what to use to get a good white? We use the ordinary size, made of sizing starch, paraffine wax, cocoanut oil, china clay and a little bluestone. Our machines are the regular thread dressers with two brushes and heating coils underneath. Spencer (1218).

I make it a rule to use only the blue white bleaches; cream white are not at all satisfactory. The water in the size should be free from iron. I use rain water whenever possible for sizing light colors. Some time ago I had difficulty with stained goods when using water from the Ohio River for sizing, and advised the mill to install a filter. "Spencer" does not give the details necessary for forming a judgment as to the cause and remedy for his difficulty, but I would suggest that he leave out the china clay as it tends to put a yellowish shade on the yarn. Moreover the clay is of but little use for weighting, as it is brushed off when it comes in contact with the brushes of the dresser.

Antrim.

Grading Worsted Wool.

Editor Textile World Record:

Can you tell me how the various qualities of worsted wool are known and sorted out? We handle tops ranging from 44s to 60s quality; how shall I designate between a 44s and 46s and other qualities which follow in numbers so close together? Sorter (1246).

In classing and sorting wool for use in worsted manufacturing much attention is paid to the soundness and uniform length of staple and fineness of fiber. In blending the waviness and serrations of fiber are of great value and, along with the fineness, are considered because they allow of the fewest possible fibers to adhere together firmly when twisted into a thread, thus producing the greatest possible length of yarn from a given weight of top. Waviness is the crimp, or curl in wool. Wool with large, smooth scales is preferable for luster effects as they reflect the light and add to the bright appearance so requisite in worsted fabrics. As far as possible uniform length and soundness should be aimed at to insure good spinning power. Fineness to give the soft handle, and straightness in arrangement of fiber all tend to bright, clear appearance which is so desirable in a well made and finished worsted cloth.

Nothing but the trained hand and eye of an expert wool sorter can distinguish between a 44s and 46s quality. The 46s should have a larger proportion of wavy fibers. Counts do not depend entirely upon quality, but on the number of yards of yarn in 12 1/2 grains. Thus with 44s yarn 44 yards weighs 12 1/2 grains, and with 60s yarn 60 yards gives the same weight. Although there should not be much difficulty in spinning a fairly good 46s out of a standard 44s top it is not wise to spin up to any great extent. Although it would be difficult to spin good 52s out of a 44s, a fine top can be spun down without limit, that is, there would be no difficulty in spinning a 16s out of a 50s top.

J. B.

Knitting Department

THE KNIT GOODS SITUATION.

The all-absorbing topic in the underwear branch at the present time is the opening for the fall of 1911. Prices on wool and worsted lines remain the same as they were for 1910 on most numbers, but in practically every case, manufacturers are promising better merchandise on account of the softening in the prices of some grades of wool. This plan of improving the grades, rather than reducing the prices, is a satisfactory one to all interests, and the better qualities will help to make wool underwear more popular with the consumers.

There is a feeling that the limit has been reached on some lines of cotton goods for next season, more especially the women's 25-cent ribbed vests and pants and the 50-cent suits. The present year has shown a very decided decrease in the demand for these two lines. It was felt that the minimum of weight and maximum of price had been reached at which they would remain in the market, but for 1911 manufacturers are showing vests and pants, running from 5 1/2 to 5 3/4 pounds in weight, and these are being offered at $2.10, and the women's combination suits, weighing 8 1/2 pounds, are being offered at $3.75. These can scarcely be called winter weights. Nevertheless, jobbers are placing some orders on these lines.

Vests and pants to retail at 35 to 39 cents have increased in demand and several retailers have told us that they have discontinued the 25-cent line owing to the fact that they have become so poor that the customers would not buy them.

There are three or four Southern manufacturers offering 6-pound vests and pants at from $2.00 to $2.05, but these carry a freight rate which adds about 7 to 8 cents per dozen. This makes a very close proposition for the Northern jobbers to sell at $2.25, which seems to be the limit that retailers will pay for 25-cent merchandise.

One New York State manufacturer, a large factor in low-priced merchandise of this description, offered 6-pound goods at $2,10, 7-pound at $2.30, and 7-pound extra sizes at $2.35, but claims to sell only a certain number of cases to each customer who will buy better lines from him.

As for ladies' 50-cent vests and pants for 1911, there seems to be a variety of prices, weights and qualities. The Alliance Knitting Co. are offering their 8-pound combed peeler at $3.62 1/2, this being the same quotation as last year.

The Utica Knitting Co. are showing a combed garment made by the Waiontha Mills which run about 7 1/2 pounds in weight at $3.62 1/2, while some other manufacturers are showing combed goods to weigh only 7 pounds at the same price. There are manufacturers who claim they cannot buy combed yarn at a price to permit of their selling a garment that will get to the consumer for 50 cents, and they are offering goods made of a double carded yarn, runing from 7 1/2 to 8 pounds in weight. As to the bleached goods made of carded yarn, they are shown goods from $3.55 for 7 pound to $3.75 for 8 pound.

Men's cotton ribbed goods continue to increase in demand each season, and for 1911 manufacturers are offering about as good value as they were in 1910.

The Blood Knitting Co. offer their 11-pound garment at $3.60. This is made in plain stitch with mercerized collarette on the shirt and long gusseted drawer. They also show a 12-pound garment at $3.75, but their representative states that 95 per cent. of the business so far placed has been on the 11-pound garment.

The Utica Knitting Co. have advanced their price on the 12-pound coarse gauge garment from last season, 12 1/2 cents per dozen, or from $3.62 1/2 to $3.75. These people also show a 10 3/4-pound garment in fine gauge at $3.75, a 11 1/2-pound tuck stitch at $3.87 1/2 and a 12-pound plain stitch at $4.00.

The Morris Mills are reported as having sold up the bulk of their production on their two-threaded line to weigh 12 pounds at $3.75.

The Gilbert Knitting Co. are asking $3.75 for their 11 1/2-pound line, and all of these manufacturers of men's ribbed goods claim to be getting their share of the business.

Jobbers report a very satisfactory business for spring, principally on Balbriggans, the demand for ribs, nainsooks and meshes having dropped off to some extent.

A new line of underwear is being put on the market by the West Branch Knitting Co. It is called the "Twintex," and as its name implies, it is made of two fabrics; the greater part of the garment is made of knit mesh fabric, while the bands, gussets, drawer seat and trimmings are made of cambric or soisette cloth, thus combining the advantages of the nainsook feature with those of a mesh garment. These are being shown in shirts and drawers to sell at 50 cents, and suits to retail at $1.00. It is stated that the manufacturer contemplates adding the woven cloth seats to a line of light weight worsted goods also.

HOSIERY.

Hosiery lines for the 1911 fall season are all open and buyers are placing orders quite freely in the larger jobbing centers. There are not so many buyers in the East as is usual at this time of the year, but the travelers on the road are booking the orders in blanket, with details to be given when the buyers get to New York in January.

Prices are the same as prevailed during the greater part of the present season, notwithstanding the fact that cotton yarns rule from two to three cents a pound higher than a year ago, and that manufacturers claimed prices were too low then.

There are those who attribute the low prices to the buyers demanding the same quotations as last year, and others who say it is due to too early opening of the lines, but the writer cannot find any other excuse for the ridiculous prices being quoted, than that manufacturers are too axnious to sell up their production of twelve months in twelve days, whereas, if there was some unity of action, and a disposition to "make haste slowly," satisfactory prices could be obtained. The buyer should not be blamed, as it matters not so much what he has to pay for goods, as that he owns his merchandise as low as his competitor.

An exception that goes to prove the rule is that the prices of bundle half hose are somewhat advanced over last season, and higher prices by about 2 1/2 cents a dozen are being asked and obtained. One reason that this is so, is that there are only a few manufacturers making this class of goods, and there seems to be a disposition among them to ask prices in accord with the price of the raw material.

Conditions in the German hosiery center are anything but satisfactory. The duties make it extremely difficult for Chemnitz manufacturers to get any orders from this side for any quantities large enough to make much impression on the stocks that have accumulated there. Some fair sized orders have been sent out for fine gauge, sheer goods, but these are just the orders that the German manufacturers do not care to get particularly, as the making of these goods is very difficult and unsatisfactory.

Jobbers report a good business on spring lines during the past month.

Plain colors are in good demand. Laces are being bought fairly well, and some importers are urging the sale of embroidered goods with quite some success.

The lighter shades of tan are being taken freely in both men's and women's lines, and although jobbers did not place large orders on tans early, a great many duplicates have been sent in, as no other color seems quite so appropriate for summer. Pearls and slates are selling well in men's half hose; navy is increasing in popularity, and a slight falling off is noticed in the demand for heliotrope.

The total exports from Japan of raw silk, habutae, handkerchiefs and waste in 1908 amounted to $73,920,609, of which the United States took $44,025,657; and in 1909 amounted to $80,070,849, of which the United States took $45,789,581.

FIGURING THE COST OF MANUFACTURING UNDERWEAR.

This subject of estimating costs is one that is exciting a good deal of attention at the present time. Manufacturers' associations are discussing the question. It is getting to be generally appreciated that much of the trouble resulting from price cutting is the inability on the part of some manufacturers to determine the cost of their goods. They guess at the cost and then shade a price that the buyer says some other manufacturer has quoted, or else they have a poor cost finding method that deceives themselves. They frequently end in the bankruptcy courts after having demoralized the trade on their way there.

For this reason it is to the advantage of every manufacturer who does know how to figure cost that all his competitors should have the same knowledge. It is not to be supposed that every manufacturer will use the same system. He must adapt one for his own needs. Nor will any generally recognized system of cost finding altogether eliminate the manufacturer who deliberately ignores costs and makes prices that will sell his goods regardless of whether he is making or losing money. Trade conditions sometimes make it necessary to accept orders at a loss to keep the mill going and the organization together, but there can be no doubt that manufacturers will be benefited by a general exchange of ideas and explanation of methods of figuring costs and it is with this idea that the Textile World Record is publishing some articles on this subject from manufacturers showing their methods of estimating costs.

FINE KNIT UNDERWEAR AND KNIT NECKTIES

Editor Textile World Record:

I consider that figuring cost is a very simple problem, but the difficulty with price cutting would be the same if manufacturers did know what their goods cost, as most of those who cut prices count on making it up in some other way. No matter at what price goods are offered, prices will be cut. If they make money well and good and then they pay their bills; if not, some one else has to stand the loss. That class of people have always existed and probably always will. When the honest manufacturer finds that he cannot market his goods at a profit it is time for him to quit. J. T. S., Manager.

* * *

LADIES' RIBBED UNDERWEAR.

Editor Textile World Record:

Finding the actual cost of knit goods is a very important matter and one that has apparently had little attention from many manufacturers. The prices that have been obtained clearly demonstrates the fact that some manufacturers do not estimate correctly the cost of producing their goods, otherwise they would not sell them for the prices they have been sold at. We find where a great many different styles of garments are made in one mill and sold at different prices, that there is some trouble in finding the exact cost; in fact, conditions may be such as to make it impossible to determine the exact cost. We will explain our method of estimating the cost of our goods, which has been tested and found to be very accurate. We make our estimate in accordance with the accompanying form. At the end of every three months we take an inventory and the mill accounts then show us whether our goods have cost more than the estimates or not. If, for example, we estimate the yarn at 20 cents a pound and four pounds to the dozen and find that the yarn has cost us 85 cents a dozen, or 5 cents more than the estimate, we then look into the yarn question and find the reason for the difference. If we estimate our lace at 5 cents per dozen and it is later found to cost us more or less we trace this item also. The same method of verifying the estimate is applied to all materials and general expenses that enter into the cost of the product.

We find that nearly every case of yarn we receive runs about 150 cones to the case. If these cones weigh 2 pounds we are then supposed to have 300 pounds in the case. We are allowed 2 per cent. for cones and paper, which makes 6 pounds less. We have also found that 20 of these empty cones weigh one pound, which would be equal to

7 1/2 pounds of cones in every case of 150 cones. We also find in addition to this there is from 3 1/2 to 4 pounds of paper in every case, making 11 1/2 pounds of cones and paper, for which we are allowed only 6 pounds. At 20 cents a pound for the yarn, this means a loss of $1.10 on every case of yarn. We do not know whether other manufacturers have gone into this matter and made allowance for it in their estimate of cost, but we make it a rule to do so. We shall be gratified if this information proves to be of value to our fellow manufacturers.

150 cones in a case of yarn
2 lbs. to the cone

300 lbs. yarn in a case

Twenty cones weigh one pound.
7½ lbs. of cones in a case
4 lbs. paper in a case

11½ lbs. of cones and paper
6 lbs. allowed for cones and paper

5½ lbs. of cones and paper in excess of 2 per cent. allowance.

Estimated Cost.

Seconds	$ .01
Yarn, 4 lbs., at 20c. per lb.	.80
Piece work per doz.	.22
Day work	.10
Lace	.05
Cartage and freight	.02
Needles	.01
Tape	.04
Boxes	.05
Cases	.02
Repairs and insurance	.02
Commissions	.12
Bleaching	.10
Thread	.04
Power	.01
Buttons	.04
Cambric	.04
Heat	.01
	$1.70

Two per cent. allowed for seconds sold at 50 cents per dozen less than firsts.

Actual Cost for Three Months.

Yarn	$ .82
Piece work	.21
Day work	.10
Lace	.05
Cartage and freight	.02
Needles	.01
Tape	.04
Boxes	.05
Cases	.02
Repairs and insurance	.02
Commissions	.12
Bleaching	.10
Thread	.04
Power	.01
Buttons	.04
Cambric	.04
Heat	.01
Seconds	.01
	$1.71

Estimated cost per dozen	$1.70
Actual cost for three months	1.71
Selling price	1.85

Editor Textile World Record:

One of the serious evils in the knitting trade is the ease with which inexperienced men can become knit goods manufacturers. First, a machine salesman comes along with his story of how much can be made out of a small investment, showing where he can turn out one hundred dozen goods a day and make from 30 to 40 cents on each dozen. After talking the thing over with Maria, Si thinks it will only be a few years before he will be wealthy and able to retire. He then visits the "sky scraper city" and is introduced to a pleasant gentleman who hands him a 25-cent cigar and a soft seat, then gets out his lead pencil and starts to figure how much money Si can sure make by manufacturing a certain garment that can be sold over the retail counter for five cents. He then gives an order for 100 cases to start with which makes poor Si's heart leap with joy. Si then goes back to his country home and starts in to make the goods at the prices to suit the seller and the buyer. He of course has an able bodied son and two or three girls that he has to keep anyhow, and he figures their labor at nothing. Notwith-

standing all this, poor Si at the end of the season after he has delivered all the goods, is disappointed to find that his own labor has been sacrificed, as well as that of his wife and children. He has some bills to pay and nothing to pay them with. The commission man got his, the jobber his, and the retailer his, but poor old Si got left after working night and day wearing out his machinery and running himself in debt. This is the end of Si's first year in the knitting business. He then says, "By gosh, no more of that for me, I got to get better prices or I can't stand the strain."

He tells the story to the commission man who says, "Well, you can't expect to make anything the first year, you must have experience," so Si commences to figure the cost of his next year's goods, not knowing just what his last year's goods cost him, because he has no way of finding out. He, however, figures a little too high for the gentleman with the cut-a-way coat, who writes back that the price is entirely too high and that one of his neighbors are offering the same thing at ten cents a dozen less, and unless he can meet the price or somewhere near it he will not be able to sell his goods. Not knowing the exact cost of the goods Si is in a quandary to know what to do, so he says, "Well, if that fellow can sell them for ten cents less, I can too, by gosh!" So he takes the orders at the reduced price, and at the end of the season finds himself in about the same position as when he started, not having enough profit to pay the wear and tear on his machinery, not saying anything about wages for himself and family, as he figured his own wages less than one-half that he would have accepted from an employer.

These conditions have been repeating themselves for as many years as the writer can remember. I, however, hope that through the columns of some of the valuable journals the cost of production may be made plain enough so that every man may be able to tell at least how much it has cost him to produce the goods he has put on the market. Then if he sells at a loss for the sake of getting an order from his neighbor, he deserves to suffer the consequences. I firmly believe that a great many goods are marketed by manufacturers who are ignorant of their actual cost. This forces the manufacturer who knows what his goods cost to sell them so close that he is not much better off than Si himself. A Pennsylvania Manufacturer.

[We have received a number of other valuable letters on this subject, which will be continued in the next issue. We invite further correspondence from those who have facts to give and pay for everything printed.]

A WELL-ILLUMINATED KNITTING MILL.

By FRANK B. RAE, JR. and ROSCOE SCOTT.

Some of us are like the celebrated old woman who lived in a shoe, and who "had so many children she didn't know what to do" when it comes to the matter of deciding what particular system of illumination, or type of lighting unit, to install in the factory or mill. No sooner does the fact become known that Smith & Company are in the market for lighting appliances with which to equip their new plant, than there bob up, to parodize a well-known verse:

"So many styles, so many breeds
Of wares devised to furnish light,—
When all the general manager needs
Is just to know—which one is right?"

When the proprietors of the Long Island Knitting Mills tackled the problem of lighting their new factory building in Brooklyn, they, too, were in doubt regarding the choice of a system.

The building in question is two stories high, 90 by 90 feet, of brick construction, and is devoted to the manufacture of high-grade knitted goods, including jerseys, sweaters and bathing suits. The machinery, consisting of seven winders, forty Leighton "Jumbo" sleevers, besides Stafford & Holt machines, Seyfert & Donner knitters, small body machines and Crane flat ribbed machines, is located on the second floor, while the operations of sewing, pressing and packing are confined to the first floor. It is, therefore, logical that we should consider

first the illumination upstairs, where the earlier operations are carried on.

If in every factory, wherever possible, the practice were observed which has been followed in this particular one, namely, to whiten the walls, pillars and ceilings, there would be fewer complaints about insufficient light, to say nothing of the added incentive to cleanliness. Dark walls absorb light as a sponge soaks up water, while light colored walls reflect the rays back into the room where they are needed. Approximately 25 per cent. more useful light can be obtained from a given installation if the walls and ceiling are white than if they are of a very dark hue.

But the walls cannot do anything unassisted, in the way of furnishing illumination. Efficient lamps,—that is, lamps which give a large amount of light for a given expenditure of electrical energy, are necessary for good results.

Even the lamps, by themselves, will not give the best results unless they are backed up by scientifically designed reflectors, which will catch the rays that start for the ceiling and other undesirable destinations, directing them down to the level of the work, at the same time shading and protecting the employes' eyes from the glare of the light source. There you have, in a nutshell, the principles of commercially satisfactory illumination.

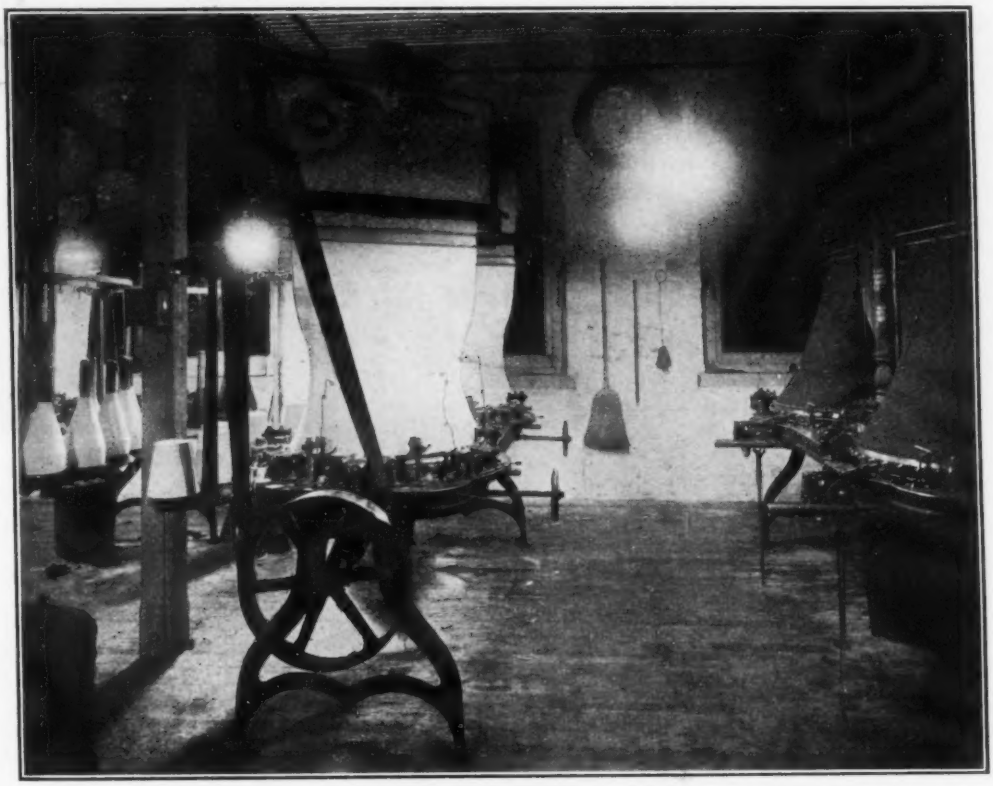


FIG. 1. CRANE MACHINES LIGHTED BY MAZDA LAMPS WITH HOLOPHANE INTENSIVE REFLECTORS.

Take the Crane machines in this knitting mill, for example. They are lighted by units consisting of Holophane steel intensive reflectors with 60-watt Mazda high efficiency incandescent lamps, hung 6 feet 6 inches above the floor, as shown at Fig. 1, and indicated by the small circles in

the diagrammatic plan shown at Fig. 2. The reflectors concentrate the light upon the work, and at the same time shield the operator's eyes from the glare, which would otherwise distract and confuse him when repairing a break, should he chance to glance up. At such times the work should receive all the concentration, speed and patience which the employe can give. The operator of these machines declares that he can work as well after dusk by the Holophane-Mazda illumination as he can by broad daylight.

For the illumination of the winders the same steel reflectors with 60-watt lamps are also used. There are seven winders, each 14 feet long and four feet wide, placed side by side. Two girls work on each machine, one on each side. Lighting units are suspended 7 feet above the floor, located between machines, and spaced 8 feet apart. While the height of suspension is such that the lamps are in no danger of being struck or broken by operators, they shed ample light upon the machines due to the efficient reflecting and diffusing inner surface of the reflectors.

The other knitting machines offer an entirely different illumination problem from that presented by the flat ribbed machines. The former are automatic in their operation, being fitted with bunch stop and thread stop so that in case a thread breaks or becomes snarled, the machine stops immediately. This means that it is not necessary to have a strong, concentrated light on any particular part of the machines. On the contrary it is far preferable to have a well-distributed,

FIG. 3.

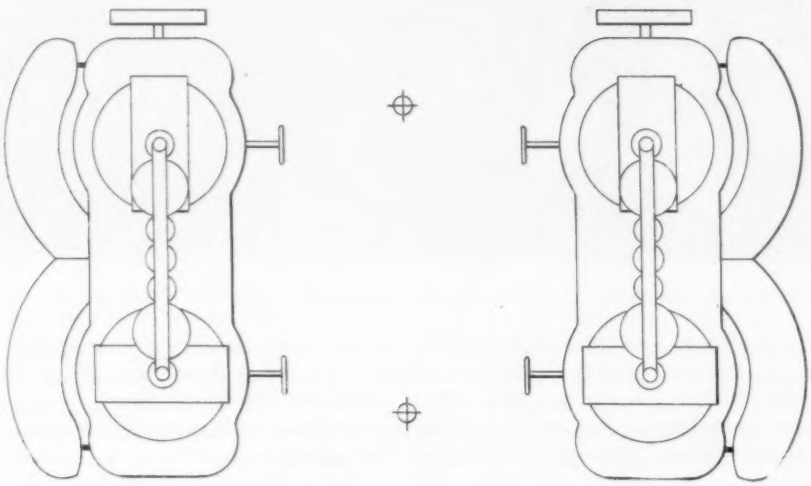


FIG. 2. SKETCH SHOWING LOCATION OF UNITS IN FIG. 1.

even illumination over the entire lower portion of the room. The lighting units, therefore, are distributed as uniformly as practical over the knitting machinery.

Shadows from belts, pulleys, castings, etc., are broken up to a much greater extent if a large number of units hung fairly high are employed than if the light comes from a few units of high candle-power placed down close over the machinery. How well the problem of breaking up shadows has been solved in the Long Island Mill may be judged from Figs. 3 and 4.

The danger of accidents to employes is much greater in dark rooms, where it is sometimes impossible to tell what is substance and what is shadow, than it is in buildings like the one here illustrated, where the room is properly illuminated, causing objects to stand out with their natural daylight appearance. It probably seldom occurs to a superintendent to put the blame for unfortunate accidents upon an inefficient and insufficient lighting system. But it cannot be disputed that such systems are often at the root of the trouble. In these times, when, thanks to modern high efficient reflectors and lamps, plenty of light can be obtained at a comparatively low operating expense, there would seem to be scant excuse for clinging to obsolete methods and systems of illumination. [The lighting of the sewing, packing and stock tables will be considered in another article.]

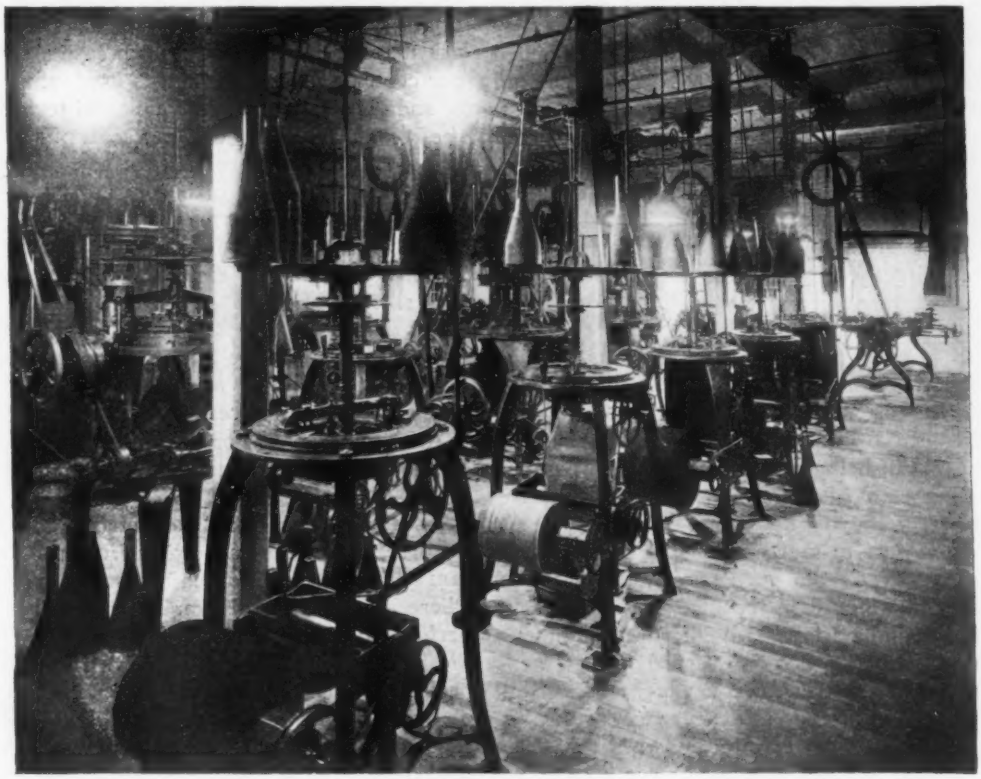


FIG. 4. ARRANGEMENT OF LIGHTS WITH PROPER REFLECTORS TO GIVE WELL DISTRIBUTED ILLUMINATION WITHOUT SHADOWS.

The imports of cotton goods into the Philippines in 1909 were $7,094,276, of which the United Kingdom contributed $3,443,814, the United States $793,719, Japan $738,631 and Spain $511,404.

Dyeing, Bleaching, Printing, Etc.

BLEACHING KNIT GOODS.

BY HERTFORD.

Cotton knit goods are generally bleached with solutions of chloride of lime and soured with either anti-chlor or oil of vitriol.

The grey goods must first be well boiled out in a kier in order to decompose and render soluble the various impurities existing in the raw fiber. These consist for the most part of resinous and waxy matters which are highly insoluble in water, and consequently would be but slightly acted upon by the bleach liquors if the raw fiber was directly treated with the latter. If the cotton yarns from which the goods have been made are of the carded variety, there will also be present a considerable amount of motes consisting of particles of the hull of the cotton-seed and other miscellaneous dirt. In order to render these substances capable of being removed by the subsequent processes of bleaching it is essential that the goods be thoroughly boiled out.

A variety of methods of kier boiling may be employed. An open kier system may be used; in which case the kier consists merely of a round upright tank of suitable dimensions. In the bottom is provided a perforated false structure on which the cotton material is placed, a clear space of six to eight inches being allowed between this false and true bottom for the accumulation of liquor and the placing of steam pipes. The rolls of knit cloth are packed into this kier systematically so as to avoid possibility of tangling when running out. The packing must be as even as possible so as to prevent uneven distribution and channelling of the liquor through the goods during the boiling. The goods should be packed into the kier until it is about five-sixths filled to the top, then a perforated wooden cover is clamped down on the material so as to hold it in place. To facilitate the wetting-out of the cotton in the kier when first starting to boil, it is best to pass the goods through a tank of hot water and between squeeze rolls before they are run into the kier. The liquor employed for boiling-out in this kier is usually a caustic soda solution, containing 3 to 5 per cent. of caustic soda on the weight of the goods. A mixture of caustic soda and soda ash may be employed, in which case about 3 per cent. of each ingredient is used. Silicate of soda is also a suitable compound to use in the boiling process, 4 to 6 per cent. of silicate being used with 3 per cent. of caustic soda. There are a number of bleach assistants on the market which form very good boiling-out agents, and these as a rule consist of various mixtures of caustic soda, soda ash and silicate of soda. For the handling of small quantities of material it is sometimes advantageous for the bleacher to buy these "assistants" as they are compounded in a convenient form for ready use.

An all-important point in the proper boiling-out of cotton materials is the circulation of the liquors through the goods. In an open kier this is usually effected by an injector, the liquor being drawn from the bottom of the kier and forced around to the top where it is distributed over the goods by the perforated cover. The liquor is raised to the boiling point by steam blown through a perforated pipe in the bottom compartment of the kier. In the open kier boiling it will require boiling for 10 to 12 hours to bring the cotton to the proper condition. It also requires the use of a large amount of steam both for the heating and the circulation of the liquor, and of this steam a vast amount goes to waste in the open air. On this account open kier boiling cannot be recommended as an economical process. The prolonged treatment which is necessary is also liable to bring damage to the goods in many ways.

Another method for the boiling-out of cotton goods is to use a closed or pressure kier. There are a number of types of these kiers on the market. In one form of kier the circulation is maintained by a steam injector. A pressure of 12 to 16 lbs. is usually

maintained in the kier during the boiling. The time required to complete the boiling-out is 8 to 10 hours, and the usual chemicals already mentioned as being used in the open kier are employed, about 3 per cent. of caustic soda or its equivalent in other compounds being used. In another form the circulation is brought about by a vacuum chest operated by high pressure steam. The pressure in the kier is maintained at 10 to 12 lbs., and the time of boiling is reduced under usual conditions to about 2 hours. The amount of chemicals required for this form of kier is much less than for other types, a good boiling-out combination being 1 per cent. of caustic soda and 1 per cent. of recovered oil or other soluble sulphated oil. The use of the oil leaves the goods much softer and cleaner in appearance than when alkalies alone are employed. This is due to the fact that the resinous matters in the fiber are readily soluble in the oil and are thus easily removed from the fiber.

Whatever system of boiling-out is employed, it is necessary to wash out the goods thoroughly after the kier treatment with the alkaline liquors. This is usually accomplished by circulating wash waters through the goods while they are still in the kier. The washing is a necessary process, and its purpose is to remove all the dirty alkaline liquor from the cotton together with all the associated impurities contained in these liquors. If the washing is imperfect, kier stains will be left on the goods.

After the goods have been boiled-out and washed the next process is treatment with the bleaching liquor. The method of handling the goods in this process will determine the strength of chemic to employ. There are two general methods of handling knit goods. In the first method the goods are run continuously in a long chain through the liquor, entering the tank at one end and passing spirally up and down over a revolving winch or slated roller and passing out at the other end of the machine. In this method the cloth is simply padded with the chemic, and as it passes out of the machine it goes through a pair of squeeze rolls for the purpose of removing the superfluous liquor. The cloth is then folded down into suitable boxes and allowed to stand exposed to the air and light for from one to three hours, depending on the degree of bleaching desired. In this continuous process of treatment the strength of bleaching powder solution is generally about 2 1/2° to 4° Tw. After the goods have whitened up to the proper point they are run in the same continuous manner through another tank provided with running water for the purpose of washing out the lime from the cloth. From the washing tank the goods then pass directly to a third tank containing a solution of anti-chlor. The amount of this chemical required will depend of course on the strength of the chemic originally employed, but usually from 5 to 8 per cent. of the weight of the goods will be necessary. Anti-chlor consists of bisulphite of soda in solution and it possesses the property of neutralizing chlorine compounds and thus removing them from the fiber. Instead of using anti-chlor it is also possible to employ a dilute solution of sulphuric acid. A solution of about 1° is the customary strength.

On knit goods, it is probably better to employ anti-chlor as the chlorine compounds are more quickly and completely neutralized and there is less danger of acid spots on the goods. The treatment with either anti-chlor or acid is termed the "souring" process, and at this point the bleaching action is finished. A very thorough washing is then necessary in order to remove all trace of the sour or acid. Whichever agent is employed for the souring, acid will be formed in the goods as a part of the reaction, and if this is not completely removed the goods will develop tender after a time and turn yellow. Subsequent to the washing process it is usual to give a further treatment with a solution of soap or other softener in which a little bluish violet coloring matter is dissolved for the purpose of tinting.

The second method of handling the goods in the bleaching may be termed the discontinuous method. Instead of running the cloth in one long chain through the machine continuously, the separate rolls of cloth are treated as units. A string tub machine is

used, which consists of an oblong tank over which revolves a large spar roller or winch for the purpose of carrying the cloth. The separate rolls of cloth are strung over this roller and then the ends of each roll are tied together. Suitable prongs are provided in the machine to keep the different rolls apart. In this system the goods are bleached together in the machine, and do not require to be aged in the air while saturated with the chemic as in the other process. All of the processes are carried out in the same machine without removal of the goods. The first bath to be given is the chemic, which consists of a solution of bleaching of about 1° to 1 1/2° Tw., and the cloth is run in this solution for 1/2 to 1 hour, depending on the degree of bleaching desired. If the cloth is made from low grade carded yarns which are very much specked with seed motes, it will be necessary to heat the bleaching liquor to 100° Fahr. towards the end of the run in order to remove the seed particles.

After the treatment with the chemic solution, the latter is run out of the machine, and the goods are then given a good washing with fresh running water for 30 minutes to 1 hour, depending on the amount of water employed. The treatment with anti-chlor solution is next given, using about 5 per cent. of anti-chlor on the weight of the goods. The souring will require about 20 minutes. A thorough washing is again given, after which the goods may be soaped and tinted if desired.

The latter method of treatment is to be preferred to the former or continuous process for several reasons. In the first place, in the continuous process one end of the cloth receives a longer treatment with the chemic than the other end. The first end of the cloth out of the chemic bath remains at the bottom of the boxes and consequently is the last end out of the boxes to go into the washing and souring baths. The difference in time between the passage of the two ends will vary from one-half to one hour, depending on the length of the chain of goods. This introduces a serious element of unevenness in the bleaching which is continually causing trouble in this system of handling. In the second system each portion of the goods receives the same treatment all through so this factor of unevenness is eliminated. In the second place, the continuous system requires the use of stronger solutions of chemic which is always an element of danger in the production of streaked goods and over-bleached spots leading to tender and spotted fabrics. Furthermore the fact that the goods remain for such a considerable period saturated with this strong chemic may lead to streaked and tender goods. The lime and chlorine compounds are also more difficult to remove from the cloth, and there is also danger of portions of the goods drying out at the edges and thus leading to the formation of tender parts.

As to the size of the machine required for the treatment of 500 lbs. of knit goods at a time, it would be best to obtain a kier of sufficient size to take care of a day's production. The tanks required in the continuous process should be of sufficient size to hold about 500 gallons of water. The tank required for the discontinuous method should hold about 1,000 gallons, and should be of sufficient length to be able to run 12 to 14 rolls of cloth, as this would probably take care of the 500 lbs. of goods mentioned in the inquiry.

In addition to the boiling kier and the tanks a hydro-extractor will be required for removing the excess of water from the goods. A drying apparatus will also be necessary, of which there are two forms in general use. In the one the rolls of damp cloth are drawn up over a wire cylinder through which hot air is blown. When the cloth arrives at the upper end it is dry and is rolled up into an even roll in a slightly stretched condition so as to remove all creases and folds. In the other system of drying the cloth is carried through a drying chamber heated with steam coils and through which air is passed by means of a fan. The goods are folded up and down over rods in the loose state, and on this account it is necessary to smooth out the wrinkles in the cloth afterwards by a special device of stretching and taking up on a roller. In the case of formed goods in which the cloth is of uneven

width throughout its length, the second system of drying is probably the most desirable.

FINISHING MELTONS.

BY WESTON.

(Continued from October.)

By fulling both in width and length, a greater firmness of felt and a better finish are secured. The temperature and the length, a greater firmness of felt and a better finish are secured. The temperature and the fulling in length need to be carefully regulated so as to secure uniform results. By opening the back door of the mill an excess of heat may be avoided. If more ventilation is required, the front doors may be opened to suit, causing a current of air to pass through the mill. Where the cloth is properly constructed and the temperature attended to, there is no objection to running the cloth double, but it will require additional ventilation.

The fulling soap should be used cold, and the moisture regulated by additional soap as the cloth gets dry, otherwise there will be a danger of chafing. Too much moisture should also be avoided as it tends to a spongy effect.

It is a good plan to tack the selvages, especially if they are inclined to roll. If the selvages are slack the tacking will hold them in place.

In the scouring there is no call for any special treatment, except that plenty of time should be taken, on account of the density of the felt. In rinsing off, a liberal supply of warm water should be used. While rinsing with the cold water, it is a good plan to close the outlet gates of the washer and allow sufficient water to accumulate to cover the cloth thoroughly. This opens out the folds of the cloth and gives the water a chance to work out the residue of the soap.

In the dry finishing it is a good plan to give the cloth a brushing before shearing.

If the shear brushes are in good order, this may not be necessary. The back or laying brush of the shear should not be allowed to fill up with flocks and become useless. The raising brush should be true and applied sufficiently hard to raise all the long and loose fibers that lay on the surface of the cloth. To illustrate the importance of making good use of these brushes, we will mention a case that came under the writer's observation. A certain mill that had gained a reputation for making excellent meltons, employed a finisher who had notions of his own regarding this part of the work, one of which was that the raising brush was too severe upon the face of the cloth. He adopted the plan of using the laying brush only, as that was more gentle in its action.

No very marked difference in the finish was noticed at the mill. After some months the selling agents sent to the mill some partly worn garments that had come to them with a complaint regarding the finish. The face of the cloth in these garments was badly roughed up, with loose fibers standing in every direction, and in some places rolled into little nubs. This condition was the result of the fibers that should have been raised in shearing, coming up during the wearing of the garments. By using one brush only, the fibers were being laid down all the time after the first run on the shear. By using both brushes, working in opposite directions, they would be worked up effectually. It fell to the lot of the writer to correct the difficulty; and in addition to the discarding of the raising brush, we found the laying brush so completely filled with flocks that it had little more effect than would a wooden roller of equal size. Had it been true that the raising brush injured the felted surface, the fault would have been in the poor quality of the felt rather than in the action of the brush. To get the best effect in pressing, the cloth should be slightly moistened by steam or otherwise, before entering the press. Then given a good firm pressing, running on to rolls to remain until cool. A light steaming to remove the gloss of pressing from the surface of the cloth is desirable; but it should not be sufficient to impair the effect of pressing in the body of the fabric.

Sheep dip was purchased by British South Africa in the first seven months of 1910 to the value of $232,000, an increase over last year.

MODERN DYEING CONDITIONS.

BY J. DOBROYD.

(From Dyer and Calico Printer.)

Continued from September.

About 3 per cent. bichromate of soda with 5 per cent. of sulphuric acid or 4 per cent. of oxalic acid may be used. If the yellow shade left by the bichromate interferes with the shade the material is to be dyed to, sulphuric acid of about 7 per cent. and 1 1/2 per cent. of tin salt may be used. Strong mineral acids weaken the shoddy considerably, as they tender the cotton, and, if the treatment becomes severe the cotton is practically carbonized.

The dyeing may be done by using acid dyes for the wool, and mordanting the cotton with tannin and nitrate of iron, the cotton being afterwards filled up with basic dyes in the cold. Or the wool may be dyed in an acid bath and the cotton by substantive dyes, applied in the cold without the intervention of tannin and iron. Very dark colors may, of course, be dyed straight away without any preliminary stripping, and sometimes only a partial stripping is needed just to form a solid base to show up the color.

Potting is the most severe test to which a dye can be subjected, and nearly all colors are affected more or less by this process. Dark, full shades naturally bleed more than lighter ones, while brilliant colors always suffer by a loss of bloom and a general flattening appearance, and the lists and headings where they contain white cotton threads are always sullied.

The advent of machinery has greatly simplified the handling of cloth in the vat, the hand method requiring considerable dexterity in keeping the fabric open and moving. Although hawks and hawking are familiar to most of our readers it may be of interest to others less acquainted with the process to give the accompanying diagrams, particularly so, as this system is rapidly being replaced by machinery. The hawks seen in Fig. 1 were wooden handles mounted with a tapering iron point with a small toothed disc at the end, the object of the teeth being to draw the floating cloth forward and keep it opened to full width. Taking a hawk in each hand the dyer made alternate strokes, first with one hand, then with the other, drawing the cloth towards him and opening it out simultaneously, while every half minute or so he would push the folds down into the liquor.

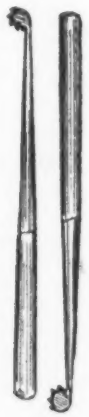


FIG. 1.

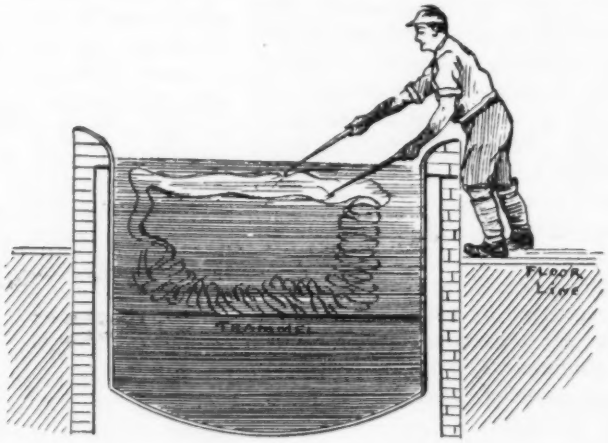


FIG. 2.

Manipulation of this kind is difficult to describe, but a fair idea may be gathered from Fig. 2, which shows the circulation of the fabric, it being of course always kept below

the surface of the liquor. Wind blobs, caused by air getting under the cloth, would cause oxidation at this spot, with the formation of a dark stain, while other stains and marks were frequently caused by the flurry or scum clinging to exposed folds. Marks were also made by the hawk's teeth. Very fine cloths and especially worsteds were liable to show rough marks where the teeth had abraded the surface, and it was found necessary in some cases to work the fabric with the back side uppermost.

Fig. 3 shows the section of a square wool vat which is gradually replacing the old circular iron ones. The section of a hawking machine shown consists of a pair of drawing rollers the full width of the cloth, together with stripper rails which keep the fabric submerged and at the same time opened out. The rollers and rails are sunk a few inches

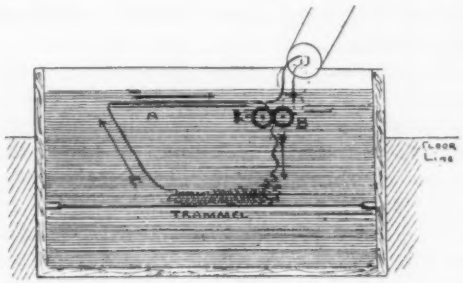


FIG. 3.

below the surface of the liquor, and the cloth, which is sewn to form an endless band, follows the direction of the arrows. The drawing rollers which move the cloth also squeeze the dye into the material as it passes between them, thus greatly assisting the penetration of thick and compact fabrics.

The imports into the United States of wool for carpet factories last year, amounted to 136,220,511 pounds, worth $16,706,728, or more than double that imported in 1908. The increase importation has continued in 1910, amounting in the first four months to $5,203,876 worth, against $4,827,022 in the same period of 1909.

SOME UNSOLVED DYEING PROBLEMS.

BY E. FEILMANN, PH.D., F. I. C.

From the Journal of the Society of Dyers and Colorists.

Considering the great antiquity of the art of dyeing and more especially the large amount of scientific work which has been done in recent years, it is remarkable how little is understood as to the real nature of the process. There are many theories, all more or less contradictory, and also, in most cases, more or less vague. Any more definite ideas which one may form from time to time are very liable to be completely upset by new sets of phenomena, usually arising out of the rapidity of technical progress, which in this field is far greater than the progress of our knowledge of the true nature of dyeing.

New types of dyestuffs, new textile fibers, mainly artificial, and new processes of dyeing and finishing arrive in bewildering succession, and as yet it can hardly be said that any adequately comprehensive explanation of this vast array of facts exists, though a clearer insight into the matter would undoubtedly be followed by more methodical investigation and important technical developments.

I propose to point out some of the more obvious and less abstruse questions still awaiting solution in this field of work, in the hope that it may be helpful to others. Most practical operations connected with dyeing obviously involve a transference of a colored substance from vat to fiber, and the same feature is characteristic of most experiments which have been performed on the subject, partly for experimental convenience and partly so that the experiments shall be more in conformity with practical operations. The question arises: Is it a peculiarity of certain colored substances to be absorbed by fibers in the precise way which we associate with the term "dyeing," or if not, do they possess these "dyeing" properties in any special degree as compared with colorless substances of similar constitution or properties?

The answer is not so simple as might appear at first sight. Undoubtedly colorless substances have a certain affinity for the

fiber. We have, for instance, the affinity of tannic acid for both silk and cotton, of which regular technical use is made, but these "dyeings," if one may call them so by an extension of the term, are much less fast than those produced by ordinary dyestuffs. Quantitative experiments are difficult to carry out in these cases. In all dyeing phenomena the relative increase of weight of the fiber is small, rarely exceeding 5 per cent., and the weight of the fiber is very liable to vary by amounts approximating to this quantity after very slight alterations in the conditions, or changes produced by the character of the dye bath; therefore determinations of the increase in weight of the fiber are not sufficiently reliable for purposes of research, and of course the ordinary method of comparison of depth of shade is impossible in these cases.

At present, in cases where the bath is not exhausted, one of two methods is generally employed. Either the amount of dyestuff on the fiber is estimated by comparison of the shade with that of a standard dyeing, or the amount of dyestuff remaining in the bath is determined. The first method is an excellent one, and perhaps the only right one in determining the value of a dyestuff for commercial purposes, but as a method of research it suffers from lack of accuracy, as shades cannot be compared with an accuracy of more than 5 per cent. at the very most, and, moreover, a given amount of dyestuff by no means always gives the same depth of shade on the fiber, through causes which are not so well understood as could be wished. The second method is indirect and also suffers from the disadvantages that in many instances the dyestuff is partially decomposed, that decomposition products of the fiber and other substances in solution in the dye bath may interfere with the analytical determination, and that there is a difficulty due to the liquor and dyestuff more or less mechanically retained by the fiber, which can often only be removed by considerable washing.

Then, again, what is the nature of the action of direct cotton dyestuffs on the fiber, and whence do they derive their peculiar properties? Are they deposited bodily on the fiber, or mainly or partially as the color acid, or in some other form? There are more or less definite statements on this latter point in some of the textbooks, but I am unaware of any detailed experiments which adequately settle the question, and it is surely important and does not appear impossible of experimental solution.

The connection between direct cotton dyeing properties and chemical constitution appears to be less clear than ever, and anyone who devoted time to attacking this problem on purely theoretical lines would earn the thanks of all interested in the subject. In this connection the fact that the affinity of cellulose for direct dyestuffs can be deminished and finally eliminated by the introduction of nitro- or acetyl-groups is of interest, and it is, at any rate, conceivable that other classes of dyestuffs may be discovered which dye these substances without mordants.

The number of problems awaiting solution in connection with sulphide dyestuffs and other vat dyestuffs, such as those of the Indanthrene series, is legion. What is the nature of these dyeing processes? Why does the introduction of sulphur into the molecule lead to such characteristic results, and what precisely is the function of the alkali sulphide in the sulphide vat? Can compounds containing selenium and tellurium be obtained possessing similar properties? This last is a question of no direct technical importance, but an investigation on these lines might throw further light on the subject by the production of crystalline substances possessing similar properties, or in some other fashion.

The action of bichromate, copper salts, and other metallic compounds on fabrics dyed with sulphide and other colors is another matter which, in view of its importance, appears not to have received the investigation which it deserves—for instance, does after-treatment with these agents affect the well-known tendering produced by sulphide dyestuffs, or does it not? Do the dyestuffs in the fiber and the metallic compounds react in molecular proportions, and

what is the nature of the reaction? These various points may, of course, have been investigated very fully by those interested, but as far as my knowledge goes little has been published.

It seems to me that a very large amount of work of a not very elaborate kind remains to be done on these lines. A large number of very valuable researches are on record on the absorption of dyestuffs by non-fibrous absorbents of the most varied kind, but these behave in many respects very differently from the animal and vegetable fibers with which the dyed deals. For example, the amount of absorption by fibers appears to be much more dependent on the temperature, and in many cases is more selective. I am at present engaged in working out analytical methods for the determination of dyestuffs on the fiber, as I think that further progress in our knowledge of what goes on in the dye vat is likely to be largely dependent on accurately quantitative investigations of the absorbent properties of the fibers themselves. Should this address encourage others to pursue research in these directions, its purpose will have been fully accomplished.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 177.

Blue on Cotton Yarn.

Immedial Direct Blue F C L on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Immedial Direct Blue F C L.
(Cassella Color Co., 182 Front St., N. Y.)
16 lbs. Glucose.
40 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
40 lbs. Glauber's Salt.

Enter at ordinary temperature and dye at 140° F. for one hour.

Immedial Direct Blue F C L possesses excellent fastness to washing and light, and is a level dyeing color.

Recipe No. 178.

Green on Worsted Yarn.

Wool Green C on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Green C.
(Kalle & Co., 530 Canal St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Dye at a boil for 3/4 of an hour. Wool Green C possesses very good fastness to light, is level dyeing, and will be found valuable in the production of compound shades.

Recipe No. 179.

Violet on Worsted Yarn.

Phenylene Violet 5 B S on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Phenylene Violet 5 B S.
(W. F. Sykes & Co., 85 Water St., N. Y.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 140° F., and dye at a boil for one hour, or until the bath is exhausted.

Phenylene Violet 5 B S shows very level dyeing properties and is remarkably fast to scouring and light.

Recipe No. 180.

Violet on Cotton Yarn.

X L Bordeaux R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. X L Bordeaux R.
(Read Holliday & Sons, Ltd., 11 Gold St., New York.)

These may all be dyed with the addition of Bichrome at the start. One-half to 3/4 of the weight of color should be used. The Bichrome and color must be dissolved separately. X L Bordeaux R possesses excellent fastness to light, leveling and stoving.

Recipe No. 181.

Yellow on Cotton Yarn.

Triazol Fast Yellow G N on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Triazol Fast Yellow G N.
(Geisenheimer & Co., 189 Front St., N. Y.)

5 lbs. Soda Ash.
20 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Triazol Fast Yellow G N possesses very good fastness to light, soaping, acids and alkalies.

Recipe No. 182.

Brown on Worsted Yarn.

Fast Chrome Brown R R on 100 lbs. worsted yarn. Prepare the dye bath with

8 lbs. Fast Chrome Brown R R.
(C. Bischoff & Co., 451 Washington St., N. Y.)
5 lbs. Ammonium Acetate.
10 lbs. Glauber's Salt.

Enter at 120°, bring to a boil and dye at a boil for 1/2 hour. Then add

5 lbs. Acetic Acid

and finally a little sulphuric acid, if necessary, to exhaust the dye bath. Then add

3 lbs. Potassium Bichromate,
2 lbs. Acetic Acid and boil for 1/2 hour.

Fast Chrome Brown R R possesses excellent fastness to light, scouring and fulling.

Recipe No. 183.

Red on Worsted Piece Goods.

Alizarine Red B on 100 lbs. wool goods. Mordant first with

3 lbs. Bichromate of Potash,
3 lbs. Half Refined Tartar C.

Enter goods cold, bring slowly to a boil and boil 1 1/4 hours. Rinse thoroughly. Dye in a separate bath with

3 lbs. Alizarine Red B.
(American Dyewood Co., 84 William St., N. Y.)
2 lbs. Acetic Acid.

Enter cold, bring slowly to a boil and dye for 1 1/4 hours.

Alizarine Red B is distinguished by exceptional fastness to light, even in thin shades.

Recipe No. 184.

Navy Blue on Cotton Yarn.

Direct Navy Blue R Extra on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Direct Navy Blue R Extra.
(Innis, Speiden & Co., 46 Cliff St., N. Y.)
20 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Direct Navy Blue R Extra possesses good coloring power and will be found valuable for the production of navy blue upon piece goods as well as cotton yarn.

Recipe No. 185.

Blue on Worsted Yarn.

Anthracyl Chrome Blue D 724 on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Anthracyl Chrome Blue D.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour. Then add

3 lbs. Potassium Bichromate,
2 lbs. Lactic Acid,

and boil one hour longer.

Anthracyl Chrome Blue D possesses excellent fastness to milling, light, carbonizing and rubbing.

Recipe No. 186.

Blue on Cotton Yarn.

Naphtogene Pure Blue 4 B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Naphtogene Pure Blue 4 B.
(Berlin Aniline Works, 213 Water St., N. Y.)
2 lbs. Soda Ash.
20 lbs. Glauber's Salt.

Dye for one hour at a temperature of 200° F., rinse and then diazotize in a cold bath made up with

3 lbs. Nitrite of Soda,
6 lbs. Sulphuric Acid, 168° Tw.,

and the necessary amount of water.

Rinse in cold water, and then enter into the bath which has been made up with the necessary amount of cold water to which has been added

1 lb. Beta Naphthol

dissolved with

1 lb. Caustic Soda, 70° Tw.

Naphtogene Pure Blue 4 B possesses very good fastness to washing, and its fastness in other respects is good for a color of this class.

Recipe No. 187.

Yellow on Worsted Yarn.

Palatine Light Yellow R on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Palatine Light Yellow R.
(Badische Co., 128 Duane St., N. Y.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 140° F. and dye at a boil for one hour.

Palatine Light Yellow R will be found to be an excellent color for use in the production of compound shades. Its fastness in most respects is sufficiently good for the dyeing of Ladies' materials, and carpet and fancy yarns.

Recipe No. 188.

Violet on Cotton Yarn.

X L Violet R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. X L Violet R.
(Read Holliday & Sons, Ltd., 11 Gold St., N. Y.)

This may be dyed with the addition of Bichrome at the start. One half to 3/4 of the weight of color should be used. The Bichrome and color must be dissolved separately.

X L Violet R possesses excellent fastness to light, leveling and stoving.

Recipe No. 189.

Brown on Cotton Yarn.

Helindone Brown 3 G N on 100 lbs. cotton yarn. Prepare the dye bath with

7 lbs. Helindone Brown 3 G N.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
6 lbs. Caustic Soda Solution, 40° Be.
4 lbs. Hydrosulphite M L B Conc. Powder.
90 lbs. Glauber's Salt.

The dyestuff should be mixed thoroughly with about five times its weight of water, together with caustic soda. The Hydrosulphite M L B Conc. Powder being added last, and thoroughly stirred in. After this stock liquor has been added to the dye bath, add the Glauber's Salt. Heat the bath to 95° F., and dye the yarn for 1/2 hour, on bent sticks, below the surface of the liquor. After the dyeing is completed the yarn is wrung out evenly and allowed to oxidize in the air for some time, and the color finally developed by soaping for 1/2 hour at a boil in a bath containing 2 parts of soap per 1,000 parts of water.

Helindone Brown 3 G N produces a yellowish shade of brown which is suitable for dyeing and printing of cotton.

Recipe No. 190.

Brown on Worsted Piece Goods.

Alizarine Seal Brown on 100 lbs. worsted piece goods. Mordant first with

3 lbs. Bichromate of Potash.
3 lbs. Half Refined Tartar C.

Enter goods cold, bring slowly to a boil and boil 1 1/4 hours. Rince thoroughly.

Dye in a separate bath with

3 lbs. Alizarine Seal Brown.
(American Dyewood Co., 84 William St., N. Y.)
2 lbs. Acetic Acid.

Enter cold, bring slowly to a boil and boil 1 1/4 hours.

Alizarine Seal Brown is distinguished by exceptional fastness to light.

Recipe No. 191.

Blue on Cotton Yarn.

Sulphurol Indigo B on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Sulphurol Indigo B.
(F. E. Atteaux & Co., 174 Purchase St., Boston, Mass.)
12 lbs. Sodium Sulphide.
8 lbs. Glucose.
15 gals. Boiling Water.

Add to the dye bath which has been heated to 160° F.

5 lbs. Soda Ash,

and then the dyestuff solution made up as indicated above. Finally add

10 lbs. Common Salt

and dye at a temperature of 160° F., keeping the material below the surface of the liquor.

Sulphurol Indigo B gives a shade of blue which is very bright for a sulphur color.

Recipe No. 192.

Black on Worsted Yarn.

Cashmere Black V on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Cashmere Black V.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., N. Y.)
15 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for one hour.

Cashmere Black V possesses good fastness to alkali, carbonizing, steaming and stoving and is especially recommended for the dyeing of ladies' dress material.

A few years ago the world's production of silk yarns was estimated at 15,500,000 pounds, viz., the Continent, 11,000,000; England, 3,000,000; China, Japan, American and India, 1,50,000.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Self-Threading Shuttle. Meynell & Co., Ltd., Accington, England. An improved self-threading shuttle which is being introduced in English mills. It is said to obviate the objectionable "kissing" of the shuttle without weakening the construction.

Warper Stop Motion. Heinrich Theunissen, Viersen, Germany. A stop motion for warpers, the thread pressing against a spring needle. When the thread breaks the needle actuates the stop motion.

Open Width Washer. L. Ph. Hemmer, Aachen, Germany. An improved cloth washer in which the goods are handled in the open width. It is claimed that much better results are obtained than has heretofore been possible with the ordinary type of open washer.

Calico Printing by the Lithographic Process. Hayes, Reynolds & Co., Shirley, Southampton, England. A process of printing cotton piece goods on the lithographic principle. The machine has been perfected so that the printing of several colors is continuous, a number of pattern rolls being employed for the printing of different colors at one time.

Evener for Woolen Cards. Sigmund Cahnmann, Bischweiler, Germany. An evener roll placed above the breast cylinder or licker-in of woolen cards. The roll carries a spiral strip of card clothing. The roller is vibrated sideways and it is claimed that in this way the stock is more evenly delivered to the main cylinder of the card.

Speed Regulator for Spinning Machines. Henri Thormann, St. Blaise, Alsaace, Germany. An attachment to ring spinning frames for enabling the speed to be varied by means of a lever.

Bobbin Changing Loom. C. A. Roscher, Georgswalde, Bohemia. An improved bobbin changing loom which is said to embody important improvements. The loom has been developed in the works of the Nordboehmische Webstuhlfabrik.

Shuttle Changing Loom. George Schwabe, Bielitz, Germany. A shuttle changing attachment by which the shuttles are automatically changed at either side of the loom.

Spring Reed. Adolf Orth, Langenberg, Germany. A spring holder for loom reeds which results in an elastic blow of the reed against the cloth.

Worsted Mule. J. Hetherington & Sons, Manchester, England. An improved mule for spinning worsted yarn. It embodies the all metal carriage and a number of other improvements.

Dobby Motion for Ribbon Looms. Gebr. Staeubli, Horgen, Switzerland, has recently placed on the market an improved dobby motion for ribbon looms. It has been installed in a number of Swiss mills with very satisfactory results.

Lubricator Alarm. W. & J. Butterworth, Rochdale, England. An attachment for self oilers by which an alarm is sounded if the supply of oil fails for any reason. The attachment has been found to be of special value in connection with self oilers on engines and other heavy machinery.

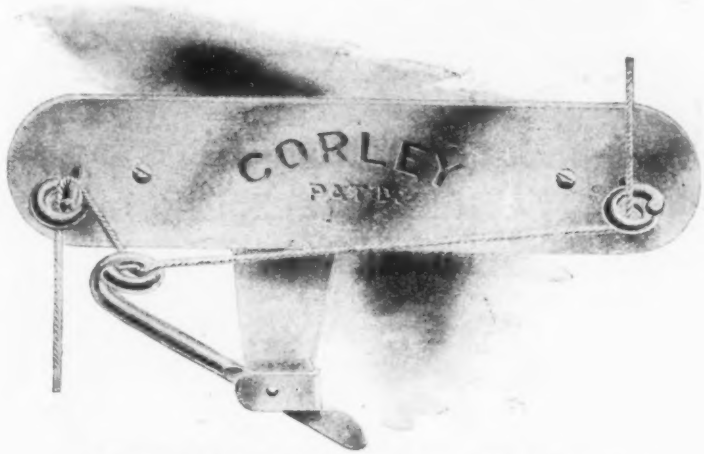
An Improved Hygrometer. Dr. A. Katz, Waiblingen, Germany. An improved hygrometer which is said to possess the accuracy of the psychrometer used for scientific work, and at the same time offers the advantage of direct reading without the necessity of referring to tables.

CORLEY AUTOMATIC THREAD GUIDE FOR WINDERS.

In the difficult process of manufacturing a high grade of soft yarn for hosiery and underwear purposes no part of the operation requires more care than that of winding, and the manufacturer or knitter who has to use the yarn is not more particular about the quality of the yarn itself than about the way it is wound, and a firm and evenly wound cone with smooth ends and a minimum of knots is greatly to be desired.

One important difficulty confronting the winder foreman in the production of this ideal cone is unequal tension on the yarn in the process of winding the cop. The tension is greater when the cop is nearly empty than when it is full and extends to the top of the spindle that holds it. With soft hosiery or underwear yarn this condition often causes waste because the yarn frequently cannot stand the strain put upon it when the cop is nearing the bottom. If when beginning to wind from a full cop the tension is adjusted to produce a firm, hard cone, when the yarn gets low on the spindle, or "on bottoms," breakages often occur due to increase of tension caused by the whipping of the yarn about the spindle and a small bunch of yarn is left on the tube to become waste material.

The amount of waste thus made from too much tension varies with the weather, quality of yarn, etc., and may be from 1/2 pound to 3 or 4 pounds per 100 spindles in a day. With the greatest care more or less waste from this cause is usually in evidence, and if the yarn does not break, there may be undue strain. If the tension is reduced sufficiently to entirely eliminate this waste the cones may be too soft and spongy.



AN AUTOMATIC TENSION REGULATING THREAD GUIDE FOR WINDERS.

In the accompanying illustrations is shown an automatic tension regulating thread guide which is being put on the market by the Corley Textile Specialty Co. of Atlanta, Ga., for preventing strain and breakage. The device is of stamped steel construction and arranged to be screwed to the front rail of the winder. For use on machines not having a rail down the front, however, it is made in other styles and may be conveniently applied to any type of winder. It consists in addition to the stamped steel back of two ordinary pigtail guides, one at each end, which are fixed, and one central guide of special construction which is pivoted. It is this central wire that controls the amount of tension on the yarn while

winding. Fig. 1 shows position of the guide when the cop is beginning to unwind and in which position it exerts its greatest friction. Fig. 2 shows the same guide at the finish of the wind and after it has been pulled up to a vertical position by the tension on the yarn, thereby relieving the friction and consequent tension which it formerly exerted, doing away with all excessive strain at this point and enabling the yarn to be unwound entirely, leaving a clean tube. The net result claimed is that the average tension at which the yarn is wound may be greatly increased without causing waste. It is also claimed that the knots will be reduced by at least 50 per cent. The company states that the guides are in successful operation and that the mills using them have increased the net weight of their cases from 15 to 20 pounds each and have reduced their waste to the minimum.

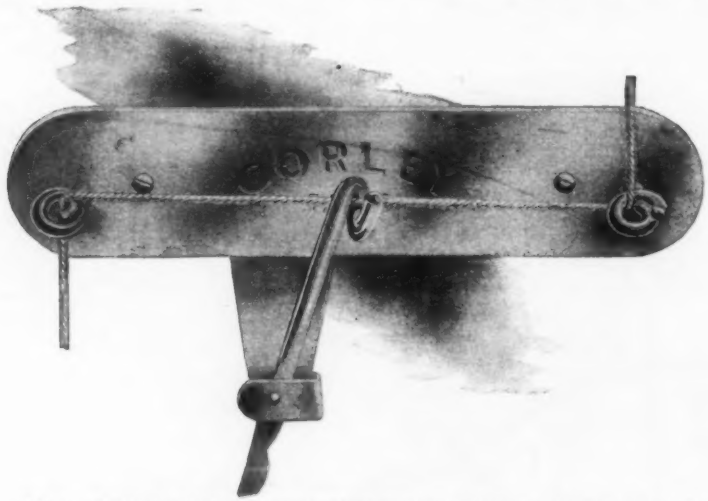


FIG. 2. AUTOMATIC THREAD GUIDE FOR WINDERS, SHOWING POSITION AT FINISH.

The British cotton mills bought 5,700 bales less raw cotton in August, 1910, than in the same month last year; but what they did buy cost them $2,000,000.

In 1909 there were in the United Kingdom 31,836,833 sheep, in Argentina 67,211,754, in Australia 87,043,266, in New Zealand 23,480,707, while the number of sheep in Canada is placed at 2,705,390.

THE WESTINGHOUSE TEXTILE TYPE MOTOR.

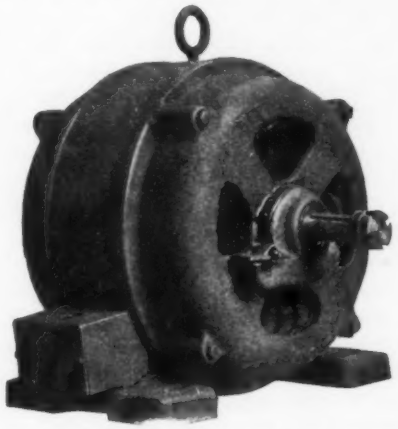
BY ALBERT WALTON

Summed up in a few words the requirements of a textile motor are: very steady speed, absolute protection from injury by accumulated dust and lint, a liberal horsepower rating, high efficiency and power factor, and special starting characteristics. To meet these requirements the Westinghouse textile motors have been especially designed to cover the requirements of pickers, lappers, cards, slubbers, spinning frames, warpers, looms, hydro-extractors, dyehouse machinery, and so on through the list of textile machinery.

The handling of tender yarns demands a speed more nearly constant than is required in almost any other industry. For best results, the speed must not only have the average value as set in the original plan of the mill, but must not be subject either to sudden fluctuations or to more gradual changes. Fluctuations of short duration are the more harmful, as for a given change in speed the shorter the interval in which the change takes place, the worse the effect on the product. Such changes are most detrimental when they assume the form of regular impulses from piston strokes of the engine or

from belt lacings passing over pulleys. Accordingly, the Westinghouse textile motor for spinning has a slip, or drop in speed, of only about 3 per cent. from no-load to full load. The power required to drive a spinning frame never under any circumstances varies 30 per cent.; when the frequency of the supply current is maintained at a constant value, the variation in speed will be well within 1 per cent. Because of this feature the application of these textile motors to textile machinery has resulted in notable increases in production from the machines previously driven mechanically.

Perfect protection from dust and lint is essential for two reasons, first to prevent it from lodging in the motor and interfering



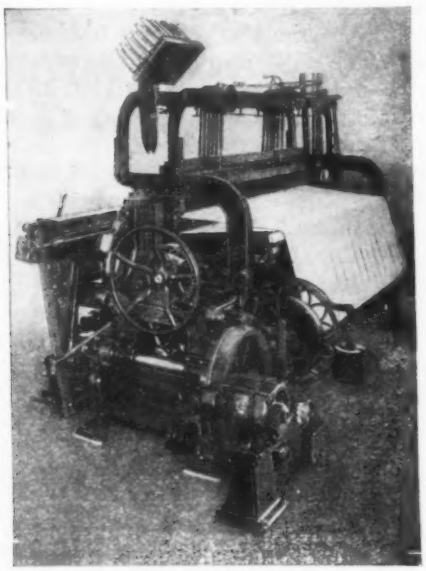
FIVE H. P. WESTINGHOUSE TEXTILE TYPE SPINNING FRAME MOTOR.

with the ventilation of heat dissipation, and second, to prevent its lodging in the bearings or in openings leading to the bearings. Ventilating ducts provided in both rotating and stationary parts of motors for ordinary service would very speedily become plugged with wads of lint, deposited gradually from the air, especially if the motors were located near the floor. This lint would not only prevent the passage of the cooling air but would act as a heat insulator, or blanket. It were better to plug the ducts with iron, which would at least conduct the heat to the surface where it would be radiated to the air. In fact, this has been the solution of the cooling problem in the Westinghouse textile motor, where all ducts have been eliminated, and the motor made large enough to run cool by radiation only. This has been possible because of the small losses incident to the good performance.

The motor is not entirely enclosed, as this has been found neither necessary nor advisable. The rotating element, however, has been made solid from end to end with no projecting parts, and the stationary part is also solid with no chance for lint to accumulate at any point on the iron or the coils; the ends of the coils are so shaped that they fit snugly together without providing a lodging place for the lint. Since no air is to be forced through the windings the coils are completely and closely covered by a rugged end-bell. The whole exterior presents a smooth surface from which the accumulation of dirt may be as easily removed as from the most accessible part of the machine it drives. These arrangements insure as cool operation at the end of a year from the day the motor is installed as at the end of the first day or the first week.

If motor bearings are not absolutely oil and dust-proof, the "fly" makes trouble by gathering on the oily surfaces; if the slightest opening exists the accumulating cotton tufts will find their way into the opening where they will absorb oil and gradually draw it from the bearings by capillary action. Bearings which are perfectly satisfactory in ordinary service cannot be used successfully in many parts of a textile mill. Cotton "fly" has been known to gather around a bearing of ordinary design and within an hour withdraw practically all of the oil and distribute it about the room. The textile motor has a peculiar dust-proof bearing housing. The bearing is ring oiling; a bronze bushing is inserted in the cast iron housing and held in place by a dowel pin which extends through the housing into the bushing. No matter what the position of the motor the bearing cannot get out of place and the slot for the oil ring is so constructed that the ring cannot lodge. The necessary slot in the bearing housing for the insertion of the ring is closed securely by a

cap screwed into place. There is thus no possible chance for the entrance of dust or lint or anything else which might interfere with the operation of the ring. It is therefore never necessary to inspect the bearing to see if the oil ring is running and no opening is provided for that purpose. A liberal opening is left at one side of the housing for



ONE H. P. TEXTILE TYPE MOTOR GEARED TO CROMPTON & KNOWLES BROAD WORSTED LOOM.

filling the bearing and to permit the oil level to be determined, but the opening is provided with a tight-fitting cap which cannot be left open.

The design of this bearing is one of the textile motor's special characteristic features and differs from the ordinary motor bearing in that the oil level can be readily determined when the top of the bearing housing is inaccessible. For example, in loom drive the gears are so arranged that it is impracticable to get to the top of the housing for inspection, but the oil opening is far enough to one side to be easily accessible. There are no other openings in the housing and hence there is no chance for oil leakage. Under ordinary working conditions a textile motor bearing will easily run 90 days without re-oiling or inspection of any sort. Quarterly inspections with annual overhauling and cleaning will keep these bearings in good condition.

Another important requirement of a satisfactory textile motor is that it shall be conservatively rated. The service is continuous from 7 a. m. to 6 p. m., and the mill must be hot and moist to work the fibers to the best advantage. These conditions are not favorable for ordinary standard motors; the textile mill motors, however, are so liberally designed that they operate continuously at a low temperature. This cool operation is important not only for satisfactory service from the motor but also for the comfort of the operatives. While low operating temperatures require somewhat larger motors, it was felt in laying out these textile motors that any other policy would be short-sighted and indefensible.

The electrical characteristics have been most carefully considered; motors of 5 and 7 1/2 h. p. and over have an efficiency of from 87 1/2 to 90 per cent., a noteworthy achievement in motors of this size. Because of the long continued use of the motors at or near their full load, a gain of even 1 or 2 per cent. is a thing of importance.

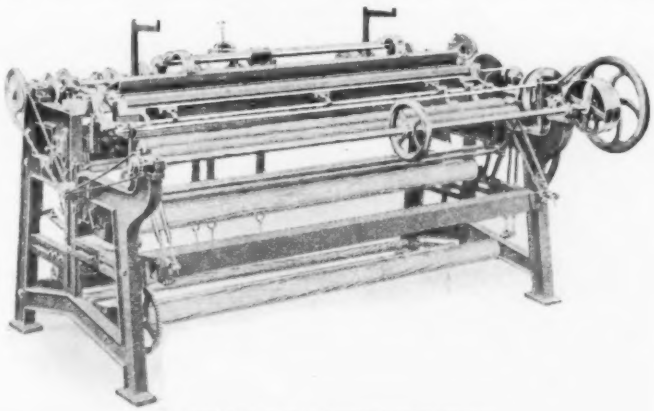
Another characteristic demanded of textile motors is the provision of a large starting torque without sacrifice of efficiency. For example, to start some spinning frames on Monday morning requires a torque equivalent to 12 h. p. lasting, possibly, for 10 seconds. The remainder of the day the load is nearer 5 h. p. But the motor must be capable of exerting this large starting torque without sacrifice of the all-day efficiency. The textile motor, which is especially designed for these peculiar conditions, easily obtains such results. While high efficiency was considered of greater importance in the design of these motors than high power factor, the question of power factor has also been given due consideration; all except the smallest textile motors have power factors well up around 90 per cent.

Textile mill practices are pretty well fixed by usage, necessity, and efficiency, and the motor must be designed to meet these fixed conditions.

HIGH SPEED WARP KNITTING MACHINE.

The illustration shows a warp knitting machine which has been perfected by Louis Strauch Kettenstuhlfabrik, Limbach, Saxony, whose American agent is Bruno W. Poetzsch, 350 Broadway, New York City.

The popularity of the fine fabric gloves and other fine knit specialties, such as nets and shawls, for which the fabric is made on warp knitting machines, gives special interest to this high speed machine because of the large production and perfect quality of fabric that is claimed for it. Running at a speed of 100 turns per minute it handles the warp yarn without undue strain and thus all thread breakage is reduced to a minimum and the goods produced are remarkably free from imperfections. The same quality lisle or silk is used as with the ordinary warp knitting machines.



A HIGH SPEED WARP KNITTING MACHINE.

The simplicity of the machine is shown by the illustration and because of its simplicity is sold at what the agents believe to be a very moderate price. Many very strong testimonials have been received from important German glove firms who are using this high speed machine. The American agent will furnish additional information to interested parties and has samples of fabrics made on the machine.

Only $266,261 worth of wool was shipped from Bradford, Eng., during August, 1910, against $1,005,873 worth in August, 1909.

THE MONFORTS' BALL-BEARING NAPPING MACHINE.

The A. Monforts Maschinenfabrik, of M. Gladbach, Germany, are now introducing to American mills their improved 36-roller, ball-bearing, napping machine, which has been in successful operation in European mills for about three years.

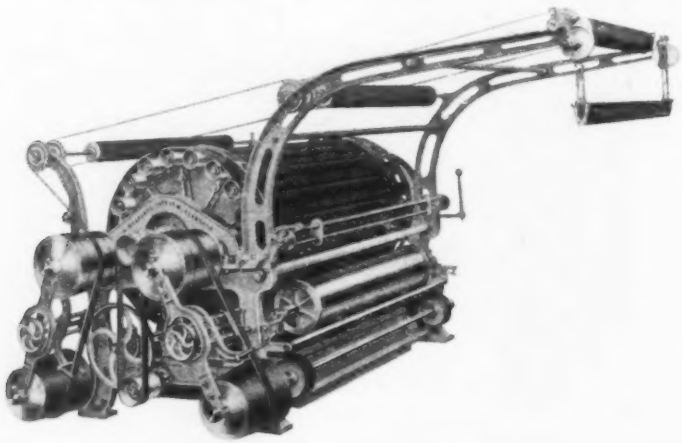
Manufacturers of napped, cotton fabrics have long sought a short, close, well-covered nap that will not be disturbed by rubbing or washing, yet one that will preserve the lofty, fluffy appearance of the finished article. Blankets, flannelette and domets are the goods on which such a nap shows to best advantage and is really necessary in order to establish superiority over competing lines. Design and finish must be relied on to sell the goods. In finishing these goods napping has been the most serious problem that the manufacturer has had to confront. To produce desired results, the felting machine has been resorted to, but it is now an established fact that this process of felting is only a remedy for poor napping. Every napping overseer knows that for the first few days, or possibly weeks, a napper of almost any good make will produce satisfactory results without felting; also that goods so produced are superior in finish to those that have been felted, for felting, as the name implies, imparts a matted finish, whereas in most cases a lofty appearance is desired.

The first Monforts' 36-roller, ball-bearing napper was installed in a blanket mill near

the works. After many weeks of steady running it continued to produce a fast, close nap with a clear pattern on jacquard work without felting, much to the surprise of even its makers, who had designed it to save power. These results proved without question that by the use of ball-bearings the napping rollers revolve at practically uniform speed, while in former constructions the slightest wear on the roller journals, which almost immediately occurred, owing to the friction at high speed, and necessarily imperfect lubrication, caused a scratchy, long nap, with imperfect pattern, necessitating felting. The saving of the cost of the felting operation, which foreign mills now make, will at once appeal to American manufacturers.

Since the first introduction of ball-bearings many arguments pro and con have arisen and no doubt many of these, both in favor and against, are well founded. While it is universally recognized that if properly applied, the ball-bearing is a great power saver at high speeds, it is also known that with some kinds of machinery high speed is a detriment. The design of the Monforts' napper, with its drive from both sides, large driving pulleys on the rollers and automatic regulation of the belts, is well suited to the use of ball-bearings. The builders believe that this machine has now reached a state of perfection. This is being demonstrated by its continued good work under the most trying circumstances and continuous night and day running for full seasons. The method of lubrication will appeal to manufacturers, as it positively prevents oil on belts or cloth and needs attention no oftener than when the clothing is ground.

Following is a summary of the most important advantages claimed for this napper: Short, close nap, well covered, with clear pattern, without felting; saving of power, 35 to 50 per cent.; saving of belts and oil; no oil on the belts, thus a positive drive; large driving pulleys on each roller; positive drive from both sides of the roller; no oil on the cloth to cause "seconds"; lubrication of worker rollers only necessary when clothing is ground; large, steam-heated, copper drum at entrance of the machine; grease and dust proof bearings; construction of the best.



THE MONTFORTS' BALL BEARING NAPPING MACHINE.

The Monforts' Machine Works are considered one of the model shops of Europe, and their foundry has an enviable reputation for the quality of its castings. In the machine shop may be found the latest tool machinery, furnished in great part by various well-known American machine tool builders, showing that every effort is made to improve the quality of the output, regardless of cost.

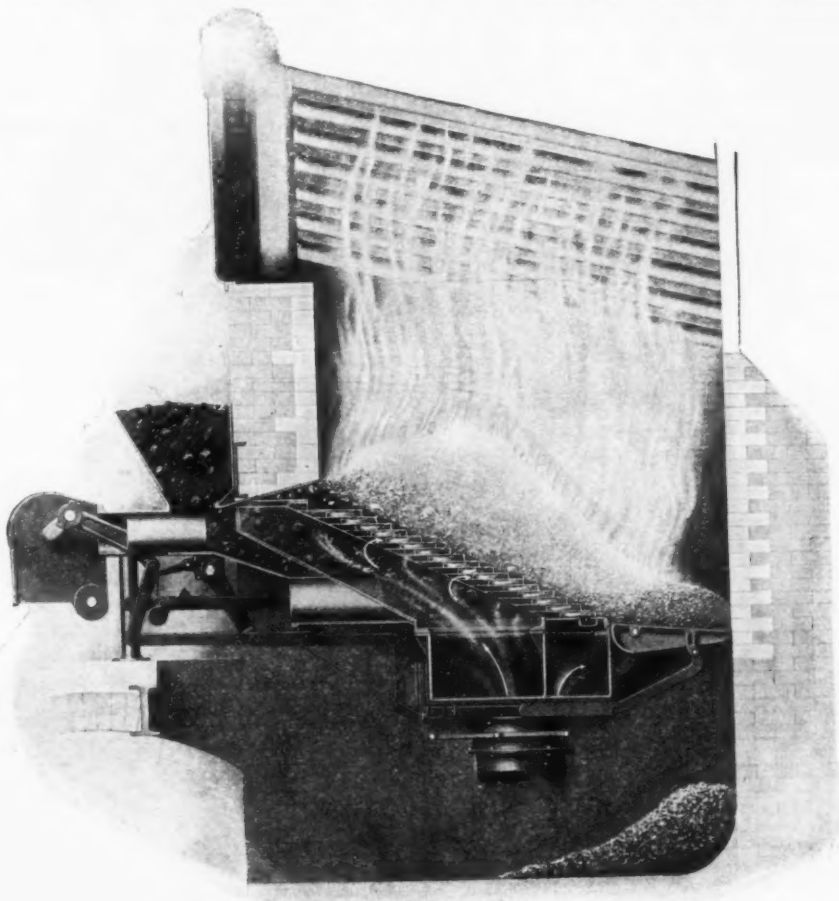
L. H. A. Schwartz & Co., 53 State St., Boston, are the American agents for this napping machine, and other machinery built by the A. Monforts Maschinenfabrik.

THE LATEST DESIGN OF THE TAYLOR STOKER.

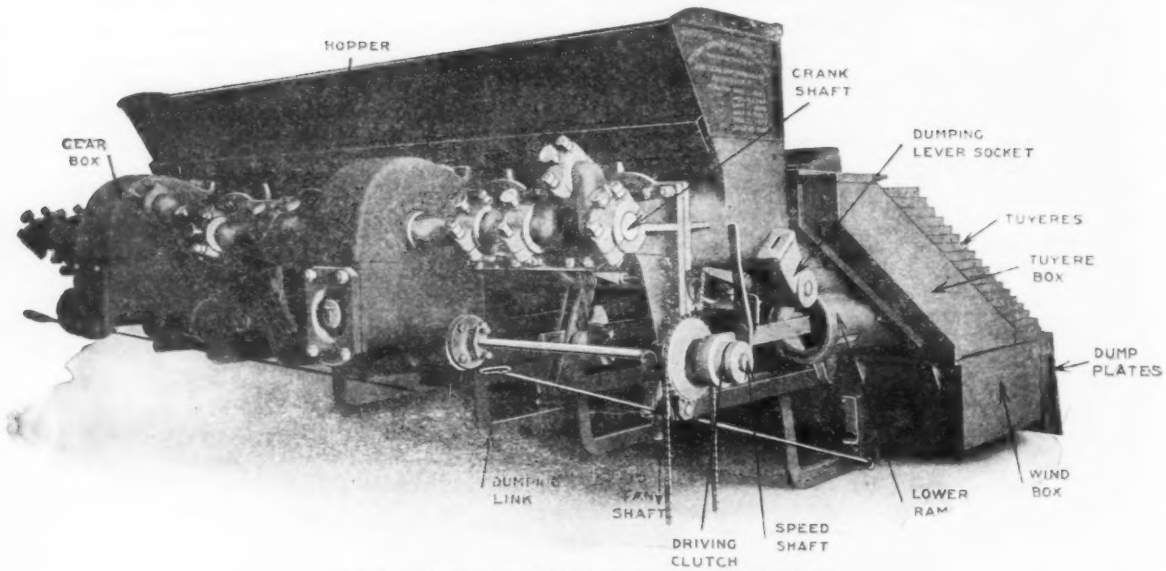
From the first the fundamental design of the Taylor has remained unchanged because of early recognition of the importance of ash removal; but improved mechanism has been necessary as larger and larger stokers have been called for. These changes relate principally to the operation of the lower line of plungers, which push the burned-out coal onto the dumping plates.

The travel, or length of stroke, of the upper row of rams which assist gravity by pushing the coal outward into the fire is constant, but the travel of the lower row can be increased to push the refuse out more rapidly just after the dumping plates have been dropped, or whenever it is desired to more quickly get rid of the refuse which has collected in the lower part of the furnace.

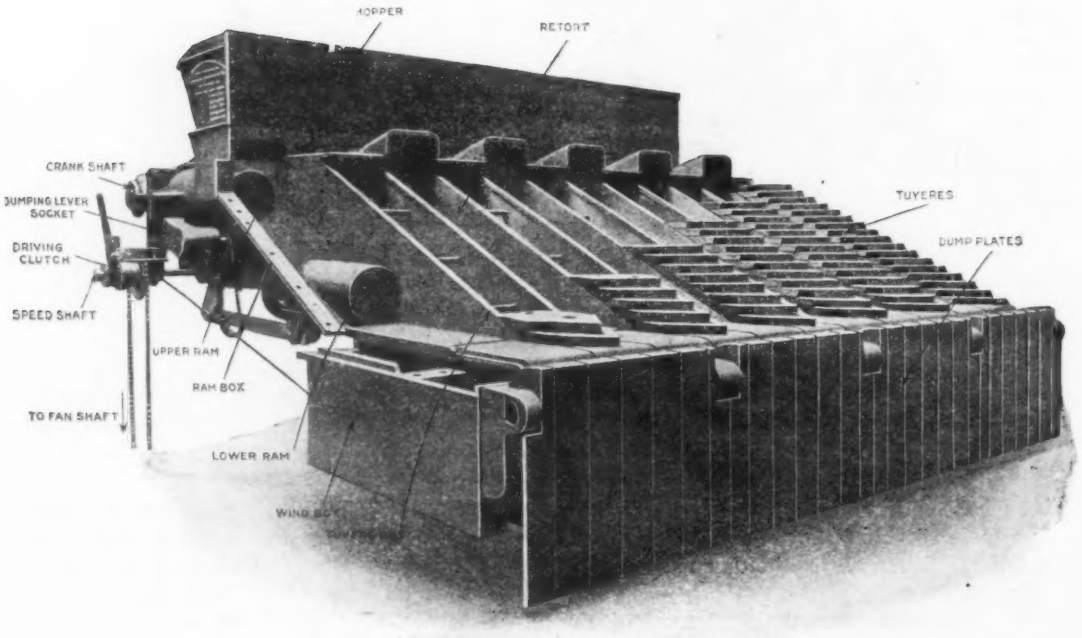
As previously built, each lower ram was connected directly to the bell crank which operated the upper plunger. Adjustment of the stroke of the lower plungers was made for each separate retort. With the improved mechanism, the travel of all the lower rams may be lengthened or shortened simultaneously. This is accomplished by means of a sort of pantograph lever connection having a cam and balance weight on the upper member as shown in the sectional view of the furnace. Pivoted to the plunger connecting



TAYLOR STOKER—LONGITUDINAL SECTION THROUGH FIRE.



TAYLOR STOKER—PERSPECTIVE, SHOWING FRONT OF STOKER.



TAYLOR STOKER—PERSPECTIVE, SHOWING DUMPING PLATES DOWN.

rods these cams are connected by means of chains, lever arms and shaft to the operating handle at the center of the stoker. To alter the travel of the lower rams the adjusting lever is dropped, releasing the cams and permitting them to become horizontal, which action lengthens the stroke of the plunger. In case the vertical connection of the bell crank lever is in such position that the cam cannot drop, it merely remains at rest until the connection moves backward and the counter-balance weight falls and carries the cam into position.

Another change which simplifies the operation of the stoker is the relocation of the speed shaft sprocket. It is now placed at the end of the stoker with the clutch and face plates which hold the shearing pin on the outside. This greatly facilitates the replacing of the shearing pins when required and also the throwing of the stoker on or off the line. It also improves the connection to the fan shaft.

A third improvement is the alteration of the dumping plates. In early forms, the dumping plate was cast in one piece, but the present design calls for a dumping plate in sections which are independently renewable, facilitating and lessening the cost of repairs. Improvements of minor importance, but which nevertheless make for simplicity, more certain operation, and reduction of repair charges, are the use of lock nuts in all places where possible jar would tend to loosen ordinary nuts, the fitting of the crank shaft brackets to the ram boxes with body-bound bolts, and an increase in the size of the gears in the gear boxes and the shafts and bearings. To insure more certain connection between the cast-iron ram boxes and the tuyere boxes they are now carefully doweled together.

The Taylor stoker has been developed to dispose of the refuse so readily that coal can be burned in the large quantities necessary for operating boilers at double their rated capacities. It makes possible the concentration of load on a few boilers and the minimizing of losses by maintaining intense fires and rapid circulation. It thus meets the conditions of what undoubtedly will be the boiler practice of the future.

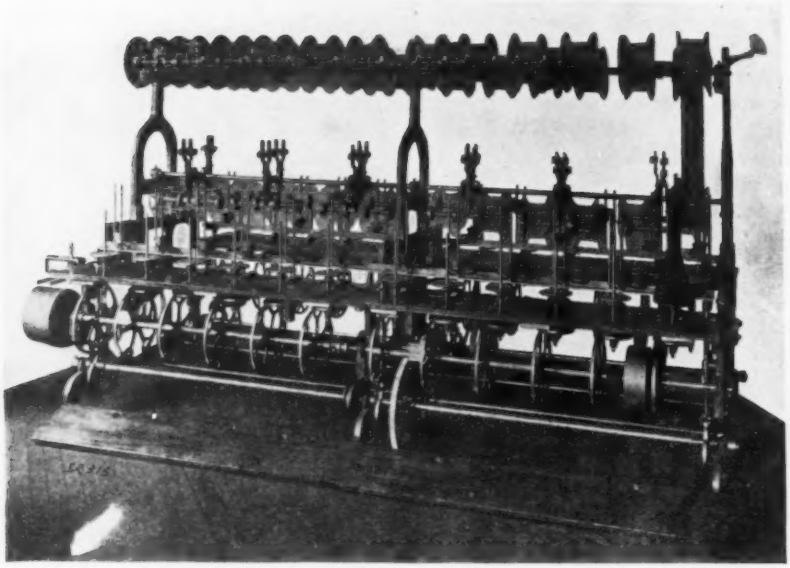
The difficulties encountered in the disposal of the large amounts of ash resulting from high rates of combustion have been overcome in the Taylor by feeding the coal beneath the burning fuel, at an angle to the fire surface, so that gravity is utilized in carrying the burned-out coal to the dumping plates at the rear as well as in the distribution of the fuel.

AN IMPROVED WINDER FOR KNITTING YARNS.

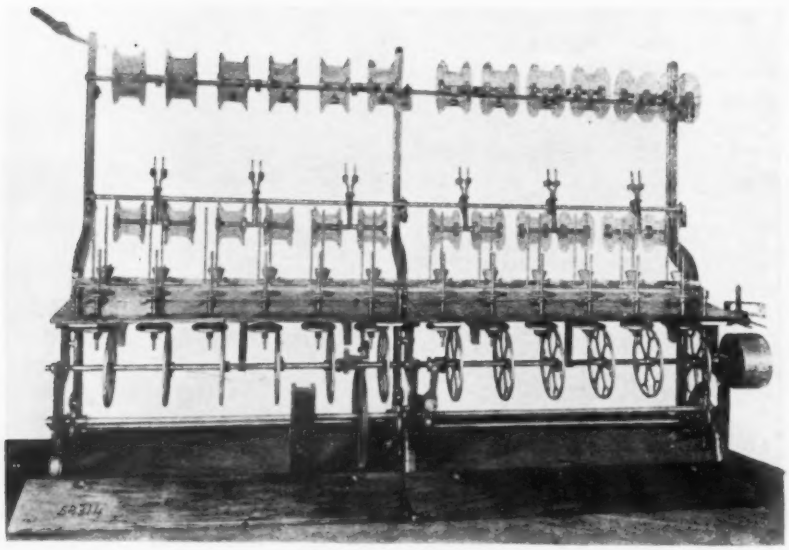
The accompanying illustrations show the improved winder built by Jacob K. Altemus, 2824 North 4th St., Philadelphia, Pa., for winding knitting yarns. It is especially adapted for any kind of yarn used for athletic goods and sweaters, and is built with any number of spindles desired. Special care has been taken to make the construction substantial in every respect. This winder is easily operated and controlled. Particularly good results are obtained in the winding of soft yarns. The variable speed motion results in a very uniform tension. This device is very simple and does not increase the amount of power required for driving the machine. The builders have aimed to produce a machine that will combine great durability, small consumption of power, ease of operating, low cost of production and perfect work. They invite comparison of results with those obtained on competing machines. The machine is built either single or double as shown in the illustrations and is guaranteed by the builders in every detail.

In addition to the winder Mr. Altemus builds a number of other textile machines that have been thoroughly tested for many years in the best mills of the country. These include the special winding machine for silk hosiery yarn, skein winders for cotton with the back wind, also machinery for spooling, warping, beaming and winding of all kinds of yarns.

The exports of raw silk and silk goods from Lyons, France, to the United States for the six months ending June, 1910, was $4,813,469 as compared with $6,008,796 in 1909.



ALTEMUS DOUBLE WINDER FOR KNITTING YARNS. (PAGE 375)



ALTEMUS SINGLE WINDER FOR KNITTING YARNS.

INFLUENCE OF SIZE ON THE OPERATING COST AND OVERHEAD CHARGES OF A TEXTILE MILL.

The larger the mill the less will be the cost per spindle and the less will be the operating cost, but it is seldom that the matter of size has such a marked effect as is shown by a recent report of Lockwood, Greene & Co., on the construction of a proposed cotton mill in the southern Appalachian district. The mill in question is to be built in connection with a hydro-electric power development, and the plan necessitated the construction of a dam, a power house, a short transmission line and the mill itself. The primary 10-hour power available for use at the generator terminals was 800 h. p. at the driest season of the year, while 95 per cent. of the time 1,000 h. p. would be available, 60 per cent. of the time 1,700 h. p., and 55 per cent. of the time 2,000 h. p. Thus any mill requiring more than 1,000 h. p. would require an auxiliary steam plant. Lockwood, Greene & Co. presented estimates on five different developments as follows:

A Development of

(A) 10,000 spindles with a wooden dam.
(B) 10,000 spindles with a concrete dam.
(C) 25,000 spindles with a wooden dam.
(D) 25,000 spindles with a concrete dam.
(E) 50,000 spindles with a concrete dam.

The following table shows the estimated unit costs and the estimated yearly cost for power under these various developments:

ESTIMATED COST PER SPINDLE.

Development	No. Spindles	Type of Dam	H. P. Required	Total Cost per Spindle	Operating Power, Cost Per H. P. Per Year
A	10,000	Wood	500	35.58	
B	10,000	Concrete	500	38.00	22.49
C	25,000	Wood	1000	26.10	
D	25,000	Concrete	1000	27.05	13.12
E	50,000	Concrete	2000	24.80	

The power estimates were based on a 21-foot fall, although the actual fall under normal conditions is 22 feet. As the same size dam would be required for both developments, B and D, the interest charges brings up the yearly power cost of the former to a very high figure in comparison. Administration, maintenance and repair, interest on investment at 6 per cent., taxes and depreciation, are included in the power cost given in the above table. As regards the type of dam, it is hardly necessary to go beyond a comparison of the estimated cost per spindle to show that the adoption of the concrete dam is the more economical. The mill is to be located on a plateau 100 feet above the river, where there is sufficient room for future development and where there is a perfect drainage. Electrical power transmission makes it possible to utilize the very best location available for the mill. The above costs were based on the adoption of concrete as the construction material for the mill. A quotation from the engineer's report will show the local conditions favored this type of construction:

"The type of construction to be used in the mill has received considerable thought. The bricks which are made locally are of rather poor quality, and we do not recommend their use, and as all materials except sand and stone, to be used in the construction will have to be hauled a distance of 14 miles, the use of timber interior construction is not recommended at this time, though more detailed study of this feature may lead to a change of view. There is in the immediate vicinity of the proposed development, a large amount of heavy oak timber, but this is not a desirable material for mill construction, although it could be used in the construction of a timber dam. It, therefore, appears to us that the mill might properly be constructed of reinforced concrete and the estimates have been made upon this basis."

The textile machinery costs were based on a gray goods 36 inch wide produce to be manufactured of about Nos. 24 or 26 yarn, 64 square or thereabouts.

As at the present time there is no railroad connection to the proposed location of this mill, the engineers recommended an initial development of not less than 25,000 spindles which could be operated at full capacity 95 per cent. of the time with the power available from the hydro-electric development, and could be operated on an 80 per cent. load factor the other 5 per cent. of the time. Thus it would not be necessary to use any coal whatever as there is sufficient wood immediately available for heating purposes.

MEETING OF THE SOUTHERN TEXTILE ASSOCIATION.

A well attended meeting of this association was held at Charlotte, N. C., on Nov. 26th. Owing to the efficient work of the committee of arrangements, consisting of H. H. Boyd, A. B. Sanders and C. A. Hamilton, the program was carried out to the satisfaction of all present.

After the meeting was called to order an address of welcome was made by Mayor Hawkins, the responses being made by J. M. Davis, of Newberry, S. C. President W. P. Hamrick, of Columbia, S. C., then delivered his annual address. At the evening session an address was made by R. M. Miller, of Charlotte, ex-president of the American Cotton Manufacturers' Association. Among the papers read at this meeting were the following:

Cotton Manufacturing in Latin America.

By W. A. GRAHAM CLARK, Commercial Agent of the Department of Commerce and Labor.

The twenty independent countries of the Western Hemisphere lying to the south of the United States are usually lumped together under the heading of Latin-America. Portuguese is spoken in Brazil and French in Hayti, the other eighteen using the Spanish language.

The great bulk of the cotton goods requirements of these countries is, and will continue to be, imported, but ten of the twenty now have local mills. In only three of these countries—Brazil, Mexico and Peru—is there much prospect that the local industry can secure any appreciable share of the market, but wherever there are any mills at all there is a demand for higher tariffs and it is of interest to American manufacturers to see what our southern neighbors are doing along this line.

I have recently returned from a trip through Latin-America in which I visited and studied the cotton goods markets of the twenty countries, and incidentally reported on their capability to compete with us in cotton growing and cotton manufacturing. Reliable data is difficult to obtain, but the best estimates I could secure show the distribution of the cotton mills as follows:

COUNTRIES.	MILLS.	SPINDLES.	LOOMS.
Brazil	137	1,000,000	35,000
Mexico	139	726,278	25,327
Peru	7	52,250	1,750
Colombia	5	20,000	300
Venezuela	2	11,000	250
Argentina	6	9,000	1,200
Gautemala	1	6,000	150
Chile	3	5,000	400
Ecuador	4	5,000	200
Uruguay	3	.....	300
Total	307	1,834,528	64,877

There are no cotton mills in Cuba, Hayti, Dominican Republic, Salvador, Honduras, Nicaragua, Costa Rica, Panama, Paraguay or Bolivia. The capital invested in Brazilian mills is estimated at $75,000,000, and that in Mexican mills at $50,000,000, so that, including knitting mills, the amount of capital employed in cotton manufacturing in Latin-America is probably about one hundred and forty million dollars.

The factors that make for the development of the cotton manufacturing industry in any country are cheap cotton, cheap skilled labor, cheap power and cheap capital, and in countries not enjoying these advantages cotton manufacturing is only possible under the protection of high tariff walls that prevent outside competition. Interest rates in Latin-America are high and skilled labor is both scarce and dear. Coal is mainly imported and costs mills at Orizaba, Mexico, about $7.50 a ton. Pernambuco mills average about $8.50 and Sao Paulo mills $11 a ton, while at Lima the coal runs from $9.75 to $11.70 a ton. Every cotton raising country in Latin-America levies a duty on raw cotton and the mills pay more for cotton than do mills in the United States. Latin-America, therefore, has neither cheap cotton, skilled labor, power or capital. The Peruvian mills under a moderate tariff are stationary in spite of a sufficient supply of local cotton, and the Brazilian and Mexican mills owe their development entirely to the fact that they have excessive tariffs.

It hardly comes within the scope of this talk to go into the details of cotton growing possibilities, but will say that Brazil is the only one of these countries that can ever raise enough cotton to have any effect on the world's market, and even there not until there has been a radical change from the present primitive methods of growing. The Brazilian crop is now about 300,000 bales and is stationary. It is grown entirely on small farms of 10 to 20 acres, and receives scarcely any cultivation from the time of planting to the time of picking. There is no prospect that either Mexico or Peru can ever raise as much as a half million bales. The boll weevil keeps cotton in Mexico from the seashore and the scanty water supply prevents its extension in the sandy Laguna section. The present crop is grown almost entirely by irrigation and amounts to about 170,000 bales. In Peru cotton is grown entirely in small oasis-like valleys formed by small rivers from the mountains breaking through the sands of the barren West Coast. This cotton is also grown entirely by irrigation and now amounts to about 110,000 bales. Two-thirds of the Peruvian cotton is grown from American upland seed, but one-third is "Rough Peruvian" tree cotton that never goes to a cotton mill, but is taken by the woolen mills to mix with wool in making "all-wool" clothing.

There is some cotton grown in Colombia, Venezuela, Argentina and Central America, but the total amounts to only a few thousand bales, and in spite of good cotton-growing soils in some sections there is in each case local disadvantages that tend to prevent its extension. In Mexico, Brazil and Peru the cotton used in the mills is mainly 1 1/8 inch staple which gives added strength to the coarse goods in which it is employed.

With few exceptions the mills of Latin-America are of one story only. Some of the mills have old machinery and are inconveniently arranged, but the majority are comparatively recent and the larger ones are well designed and equipped. With the exception of some of the dyeing and finishing machinery the equipment is almost entirely English. The mills are usually of brick and in Mexico this is stuccoed, as is the case with all Indian mills, to prevent climatic deterioration. They are usually built with saw-tooth roofs and cement floors. Wooden floors are rare.

Some mills use the water tube boiler and in Mexico a few use the ordinary underfired multitubular boiler, but with these exceptions the boiler houses are equipped with the Lancashire shell boiler which has the two fire boxes within the circumference of the shell. The engines are almost entirely of English make, the rope driving is universal, using separate ropes for each groove. It may be noted that the United States is about the only country that uses wide belts and even here they are fast going out of use.

We are also the only country that uses short spinning frames. In Latin-America as in the rest of the world the ring frames run from 300 to 400 spindles each and have the English system of top rolls, consisting of one leather covered front roll with suspended weight and two self-weighted bare iron back rolls, the middle roll being 13/16 inch diameter and the back roll 2 inch diameter. The mills usually use single roving and short draft, which is preferable to this type of rolls. As is the case with all countries in which cotton manufacturing is of recent date, there are few mules and ring spinning is the rule. The bulk of the looms are of the overpick type. Some of those with the underpick motion are fitted with the Northrop battery, and these are made in England under the American patent. The mill managers claim that the overpick motion, which gives a more gradual development to the pick, enables them to use higher speeds and in all mills where there were looms of both types I found that the underpick looms were set to run at a slower speed. In the Pernambuco mill, for instance, on 24-inch gray sheeting they were running underpick looms with Northrop attachment at 180 picks a minute, while they claimed to be getting 230 picks a minute on the overpick looms. At the Cartagena mill in Colombia where the help is inefficient and the cotton used of lower quality, I found that on 26-inch gray sheeting the overpick looms were run at 160 and the underpick with Northrop battery at only 140 picks a minute. A few of the managers prefer the underpick motion on heavy goods as giving a stronger blow to the shuttle and being more positive in its action.

Some of the larger mills are very careful about opening up and aging their cotton before use and a few of them also age their yarn. In one Brazilian mill I found that they made it a practice to keep a hundred bales of cotton opened up in the bins all the time and to use the contents of each bin in succession. The mills follow the English custom in most regards and usually have the cotton opened up and run through a bale breaker in a separate room. From the bins it is blown through a delivery pipe to the picker room where it is run through the opener picker, intermediate and finisher lappers. The lappers are usually of the 40-inch width and in going through the three machines the cotton is subjected to the action of three beaters. Two process drawing is the rule, three being used only for the finer numbers. The majority of the mills are self contained and have all processes from opening up the cotton to baling the finished cloth for shipment to the dealer.

BRAZIL.

Brazil is the most important cotton manufacturing country in Latin-America and its mills turn out annually over forty million dollars worth of cotton goods, which is about two-thirds of the total requirements of the republic. The mills make mainly gray goods and coarse colored cottons under 28 inches wide, though there are seven print mills with 30 printing machines and a few of the larger mills are now making white shirting, muslin, lawns and fancy work of good quality. Some of the larger and better managed mills make very large profits, as do some of the small coarse goods mills that are situated in the interior where the lack of transportation facilities increases the cost of imported goods, but the competition is so keen on the coarse goods on which most of the mills are operated that the mill industry as a whole does not average over 8 per cent. a year, even with the advantage of very high tariff duties.

The Brazilian mills are dependent entirely on the tariff as they have practically no other advantage. The cotton fields are in the north while the bulk of the mills are in the south. Not only are the transportation and handling charges high, but each state levies an export tax on all cotton that goes out over its borders whether abroad or to neighboring states. All machinery is imported and subject to heavy duties as are practically all mill supplies. The Government levies a direct tax on all mill sales and the mills have to purchase stamps of the Government and affix one to each bolt of cloth turned out. About half of the mills are run by steam power and have to pay high for imported coal; about a fourth are run by water power, while the remainder, including most of the large mills located around Rio de Janeiro and Sao Paulo, use electric power and pay about $50 a horse power a year in thousand horse-power lots.

Brazilian mills are unique in not using any humidifier arrangement, the managers saying that the operatives object to humidifying as unhealthy. At the same time many of the mills keep their spinning rooms closed and at such a high temperature that girls cannot stand the strain and only men and boys can be employed on the frames.

There is no color line in Brazil and negroes, half-breeds and whites of both sexes work side by side without discrimination. The overseers and foremen are usually English and as there is little published in Portuguese on practical mill work and the English foremen do not teach their assistants more than is absolutely necessary for fear of finding themselves displaced, there are as yet few mills operated exclusively by Brazilians.

Pickers and carders are paid by the day. Some mills pay draw frame tenders by the day or by

the slubbing hank, but a good many have clocks on the draw frames and pay by these. Few Brazilian mills, however, have any clocks on the spinning frames and the spinners are paid either by the side or by the weight of the yarn produced. In many cases the spinners are required to doff as well as spin, though this is not an economical arrangement. Weavers are paid by the meter or the cut. There is no standard length cut, but it is ordinarily about 30 meters, which is 32.8 yards.

Wages vary considerably in different parts of Brazil and are much cheaper in the north than in the south and of course cheaper in the country districts than around the big cities. At a mill at Pernambuco, for instance, I found that picker room hands and carders were paid 75 cents a day. The women and boys on the draw frames ran one frame of seven heads each and averaged about 32 cents a day. Fly-frame operatives averaged about 75 cents a day. Each 320-spindle spinning frame required one man at 75 cents and three boys at 24 cents a day running on 8s and doing their own doffing. Weavers on 24 inch gray sheeting were paid 18 cents for a 32.8 yard cut. Weavers ran from two to four looms each, the ordinary three-loom weaver averaging about 90 cents a day. At a correspondingly large mill near Rio Janeiro the picker room men averaged $1.05 a day, the carders $1.30, draw-frame tenders 65 cents, and fly-frame operatives $1.20 a day. Running on 30s the spinners were paid 27 cents a side of 180 spindles and a three-side spinner therefore made 81 cents a day. The spinners in this mill were girls. Doffer boys were employed and paid 36 cents a day. The weavers were mostly women and a good four-loom weaver averaged about 6 milreis or $1.82 a day.

There are 11 mills in Brazil with more than 25,000 spindles each. The largest mill is the Fiacao e Tecidos Allianca, near Rio de Janeiro, with 56,390 spindles and 1,336 looms, employing 1,637 operatives. The mill with the most looms is the Fabrica Mariangela at Sao Paulo. This mill contains 36,000 spindles and 1,700 looms, and employs 2,200 operatives. This mill works on more varied lines than any mill I saw in Brazil. It spins its own yarns. Most of the looms are on cloth under 28 inches wide, but some cloth is made up to 54 inches. The mill not only makes gray sheeting, drills, checks and stripes, dyed goods and white goods, but also dobby work, and has both hand and power jacquards for making bedspreads, vesting, etc. It also has ribbon looms, hosiery machines and large knitting machines for making knit stuff to be cut out and sewn into undershirts. There was a complete waste spinning plant consisting of a breaking-up machine, a combined picker and opener, two double automatic waste cards using tape condensers and making four 40-sliver laps at a time for use on the waste mules. The waste yarns were used partly for making scrubbing cloths and partly for making osnaburgs for baling mandioca (the native flour), the sacks being made up in the mill. In addition to the above work there was a cotton gin and a cotton seed oil mill with soap making apparatus also attached to the mill.

The Brazilian mills in baling their cloth rarely use any ties or ropes. In baling they put 15 to 20 bolts of 30 meters each in the press and tie three strands of some 20 or 30 ends of colored yarn around the compressed package. They then sew burlap around the package and ship without any outside fastening. Some of the mills use burlap, but a large number use only coarse sheeting made at the mill which they claim is usually cheaper for baling than the burlap.

The ordinary mill hours are from 6 to 10, 11 to 1, and 1.30 to 5, making a 9 1/2-hour day. On Saturdays they stop at 3.30, thus making a 55-hour week. In Brazil the custom, even at the hotels, is only two meals a day, breakfast at 10 and dinner at 6 o'clock, with a cup of coffee and hard roll in the morning and another at one o'clock if required. The mills rarely work at night, but in flush periods sometimes run up to 9 o'clock at night. There is no law as to hours of labor nor as to the age at which children can be employed.

MEXICO.

The Mexican mills run mainly on coarse goods of narrow widths, but there are about a half dozen mills that now make goods of medium fine grade, including white shirtings, muslins, organdies, fine prints, zephyrs, napped goods, handkerchiefs, napkins and towels, that compare favorably with those imported. The average mill is small and contains 5,225 spindles and 182 looms. There are only four mills with over 25,000 spindles. The largest and best managed mill is the Rio Blanco at Orizaba with 44,184 spindles and 1,675 looms making medium and high class white, colored and printed goods. This mill spins up to 80s, which is the finest number spun in Mexico, and uses a small amount of Egyptian cotton.

The men in the picker room at this mill average about 50 cents a day, the carders about the same, the draw-frame tenders 45 cents a day and fly-frame operatives 75 cents a day. On the ring frames the spinners are paid by the hank and on numbers 12s to 16s spinners run two sides of 180 spindles each, on 20s to 24s three sides, and on 30s up about four sides, averaging about 75 cents a day. Doffers are paid 38 cents a day. Forweaving 27-inch gray sheeting, 48 by 48 construction, the weavers are paid 12 cents per 27 meters, or 29 1/2 yards, which is the regulation length cut in Mexican mills. This mill has a complete waste-spinning department with 6 double wool cards and 2,400 mule spindles and works up all its own waste.

There are 41 printing machines in Mexico and a few bleaching plants, and there are a few dobbies, jacquards, etc., but the bulk of the mills are fitted only for coarse gray and colored work, and their profits are reduced by the strong competition among themselves. The Government levies a direct tax of 5 per cent. on all mill sales.

In normal times the Mexican mills run night and day and usually figure on 135 hours a week. Working in the daytime only, as at present, the mills run from 6 to 8.30, from 9 to 1, and from 2 to 8 p. m., making a 12 1/2-hour day. A few of the mills are running from 5.30 in the morning to 9

at night, making a 14-hour day, which is as long time as is worked by the mills in India which are supposed to work the longest hours and to have the most inefficient help of any mills in the world. There is a Federal law which says mills shall not work over 12 hours a day, including an hour for lunch, and which also prohibits the working of children under ten, but there is no attempt to enforce these regulations.

The price of cotton in Mexico is based on the price of American cotton plus the freight and intermediate charges, so that Mexican mills have to pay about 3 1/2 cents a pound more for cotton than do mills in the United States. Coal is so high that wherever possible the mills are utilizing water power. All machinery is imported and has to pay freight and duty. The duty is very high, but the mills have practically no other factor in their favor. In flush periods some of the mills have very large profits, but even the best mills do not seem to average over 6 per cent. a year and the average for the whole industry would be still smaller.

PERU.

In Peru there are five mills at Lima, one at Ica and one at Arequipa, each having both spindles and looms. The total number of spindles is given as 52,250, and the looms as 1,750, the industry representing an investment of $2,000,000, employing some 2,000 operatives, and consuming about 6,000,000 pounds, say 12,000 bales cotton, annually. The Peruvian mills make mainly gray sheeting, gray drills and coarse stripes and checks, but the Inca mill at Lima runs on bleached goods of 25 to 35-inch widths. There are no prints made in Peru.

The mills spin mostly 8s to 16s, the Inca white goods mill running up to 40s. The cotton used is local cotton grown from American Upland seed, but which from some twisting of terminology is locally known as "Egipto." The bulk of the operatives in Peruvian mills are Cholos (half-breeds) and there are also a few Chinese who are preferred as being more efficient and reliable. Around Lima the picker-room hands average about $1.20 a day, the carders about 90 cents, draw-frame tenders $1.10, slubber and intermediate tenders $1.00, and fine-frame tenders $1.25 a day. The spinners are usually paid by weight and average about 90 cents a day, the spinners in the Inca running up to $1.45 a day. Doffers are paid 49 cents aday. Weavers on gray sheeting running four looms make about a dollar a day, while on 30-inch shirting, 70 by 70 construction, using 30s warp and 34s filling, they are paid 35 cents per 40-yard cut and average about $1.20 a week. There are no laws in regard to hours of labor or child labor. At one of the largest mills I found that they ran the carding and spinning 12 hours a day, or 67 hours a week, and the weave shed only 10 hours a day, or 55 hours a week.

One of the Peruvian mills is of interest to us because of its competition with our goods in Bolivia. About two-thirds of the gray sheeting imported into Bolivia consists of the A and C brands of Massachusetts shirting, the first being 36 inches wide and the latter 28 inches. The mill of M. Forga e Hijos at Huaico near Arequipa in Peru, using a llama as a trade-mark, make an A sheeting of 35-inch width, and a C sheeting of 27-inch width, and also use a couple less threads each way in the construction. They are able to sell at a cheaper price than the American. In spite of the fact that their cloth is not as clean white and the yarn is much rougher than that in the American cloth, their competition is increasing. Of the seven Peruvian mills two use water power, three electricity, one steam, and one gas.

COLOMBIA.

Colombia has four weaving mills and one yarn mill, the mill towns being Medellin, Cartagena and Samaca. The largest mill is at Cartagen and has 6,200 spindles and 105 looms, spinning 9s to 12s and making 26-inch gray sheeting. On this 26-inch cloth the weavers are paid 1 1/4 cents a yard and run two looms only, while in the United States on similar goods a weaver would run eight looms and at a third of a cent a yard make larger wages. This shows that inefficient labor is not always cheap. The spinners were all boys and paid by weight, making about 40 cents a day. Very few operatives in this mill make over 60 cents a day. The mill is built near the seashore and is one story, with corrugated iron roof and floor of cement and brick. One end of the mill is open and protected only by long sloping eaves, with the result that the machinery rusts badly. The cotton used is long-stapled Colombian cotton, but is so badly ginned that the machine speeds are much reduced thereby.

VENEZUELA.

The two mills in Venezuela, one at Caracas and one at Valencia, are both owned by the same men. The Caracas mill is of recent construction and is electrically driven, using motors for groups of machines. The looms are all overpick and run 180 picks to the minute on 24 to 28-inch gray sheeting. Weavers run two to three looms and are paid 30 cents gold per cut of 54 varas or 50 yards.

ARGENTINA.

Argentina has one yarn mill with 9,000 spindles and five weaving mills with a total of 1,200 looms. The yarn mill spins mainly 12s to 16s, while the looms are run mainly on gray sheeting and shirting, drills and duck, making also a small amount of colored goods. Argentina is by far the largest importer of cotton goods in Latin-America and in 1909 bought foreign cottons to the extent of $32,579,535. In spite of the big demand the conditions are not favorable for local manufacturing. There is a small amount of cotton grown in Argentina, but the most suitable land lies far up the Paraguay river and the freight rates are high and the supply of field labor scarce, so that there is no prospect of its extension. All coal, machinery and supplies have to be imported and skilled labor is not only scarce, but owing to the high cost of living is high priced and also difficult to manage. The mills now run on a ten-hour day, but the operatives are trying to force a reduction to eight hours.

URUGUAY.

There are no spindles on cotton in Uruguay. There are only 300 looms, but these make, besides duck and coarse sheeting for use with the native strawbottomed shoe called the "alpargata," some checks and stripes, khaki, denim, plaid flannelets, bath towels, and a few fancy woven goods.

CHILE.

Besides seven knitting mills Chile has one yarn mill and two weaving mills making both cotton and linen goods. The spindles are given as 5,000 and the number of looms running on cotton are estimated at 400. The largest mill is owned by Italians and is called the Fabrica de Tejidos de Algodon, Establecimientos Gratry. It is located at Vina del Mar, near Valparaiso, and makes besides gray goods, some ginghams, stripes, colored flannels, etc. The men in the mills average about 72 cents a day, the women 48 cents, and the children about 32 cents. The bulk of the operatives are women and the mills run a ten-hour day.

CENTRAL AMERICA.

The only mill in Central America is located near Quezaltenango in Guatemala. This mill has 6,000 spindles and 150 looms and makes mainly unbleached sheeting, also a small amount of colored cottons. These are all narrow goods and cuts are made 26 varas (24 yards) long. All operatives, including even weavers, are paid by the day and average from 40 to 50 cents a day each.

KNITTING MILLS.

Besides the regular spinning and weaving mills there are in the cotton manufacturing countries quite a few knitting mills and these make mainly knitted stuffs to be cut up and sewn together for undershirts. This is an industry that can be started with a small capital and in these countries the native mills are already beginning to supply the demand. As yet there are few mills making other knitted stuffs, such as hosiery and gloves, the bulk of these being imported from Germany with the finer grades from France and England.

There is an annual import into Latin-America of some $3,000,000 worth of cotton yarn, of which Argentina accounts for about half, or $1,500,000, Brazil and Chile each for about $600,000, and Mexico and Uruguay each for something over $50,000 worth. The United States furnishes about a tenth of the Argentine yarn supply, but does very little in the other countries in this line. A large portion of the yarn imported is for the use of the knitting mills, of which there are 43, large and small, in Argentina alone. Some of the yarn classed under the head of yarn is braided and twisted yarns for making wax matches and for weaving cloth hammocks, etc., while a small portion is for use on the hand loom.

The hand-loom industry of Latin-America is small as compared with that of the East, but there are a good many hand looms used by the Indians of the central part of South America and also some in Mexico and Central America. On the Andes there is more hand knitting and weaving of sheep and llama wool than there is of cotton. In making cloth from native cotton the seeds are usually picked out by hand or else a primitive gin is employed, consisting of two rollers turned by a hand wheel. The spinning is of the most primitive type known, and the women spin as they sit on the ground in the market place selling their wares, or as they trudge along behind their flocks of sheep or llamas. The only instrument used is a short stick of wood with a cross piece fastened on the bottom. In spinning they hold a bunch of cotton or wool in the left hand and with the right pull out fibers and smooth them into a loose sliver with their fingers as they do so. When about a couple of feet have been formed into a loose rope in this way the end is fastened to the spindle-shaped stick and this with a dexterous movement of the wrist set twirling in the air or on the ground. When sufficient twist has been inserted in this way the yarn is wound up on the spindle, a hitch knot made around the end of the spindle and more fibers pulled out and smoothed into sliver, twisted, the knot undone and the yarn wound up, another hitch knot made and the process repeated as before. This system of spinning is the same that is used by the Igorrotes in the Philippines and by other primitive tribes and is behind the hand wheel system used ordinarily by the Hindoos and Chinese. In weaving hand looms are used of most primitive construction, usually with overhung lay, and in many cases they weave without anything that can be called a loom at all, fastening the end of the warp to a tree or post and running it over a round stick fastened horizontally, pushing up and down the heddles fastened to another cross piece above their heads and throwing the shuttle back and forth by hand. Cloths can today be made by machinery not only better, but more cheaply than by hand work, and hand work is only holding its own in sections where difficult transportation facilities prevent active importation of foreign goods.

In reviewing Latin-America as a whole it seems that they will shortly be making all the undershirts required and that Brazil, Mexico and Peru will dominate their home markets for most classes of coarse and medium grade goods, but that in the other countries there is no prospect of the cotton mills increasing to an extent that will affect the sale of foreign cottons. In a normal year the cotton goods imports of Latin-America now amount to some $120,000,000, and of this only about a twelfth is from the United States while in the largest markets, those of Argentina and Brazil, we supply less than 3 per cent. of the total.

Size and Size Mixing.

By E. C. GWALTNEY, Winnsboro, S. C.

Several months ago, accompanied by the overseer of weaving at our mill, I visited a number of mills in North and South Carolina with the object of getting information regarding the sizing of print cloth. It has never been my pleasure to meet with more courtesy and kindness than was shown me by several well-known members of our association. While on this trip, I learned a great deal of "how the other fellow does it," and found

that quite a number of mills were getting excellent results from widely varying mixtures, the composition of which they knew nothing. The size that one man praises, the other says is no good. One man made his own compound, and I must say for his work that it appeared to be fully up to the best.

Having had to take charge of a mill, knowing absolutely nothing of the size mixer's art, and working in the dark trying everybody's make of size, I suppose I have purchased my experience as dearly as any one present. For some time I had an idea that size was akin to witchcraft and magic, for any number of salesmen would come along with a magic gum or compound, of which only a pound or so put into a kettle of size would increase my weaving production from 5 to 10 per cent. and reduce my seconds to a mere bagatelle. Having a receptive mind and a generous disposition and being willing to try anything once, I tried them all; so you can imagine the condition of my weave room at the end of a year.

It had been my good fortune before entering the mill business to have acquired a fair knowledge of chemistry, so I decided to see what I could make out of this question, upon which no two seem to agree. First, I resolved to use nothing in my size kettle the nature and effect of which I did not fully understand, and to mix my size with a definite end in view instead of the haphazard way to which I was accustomed. My first attempt was with a mixing in which I employed only two ingredients, starch and tallow, and to my surprise I found this gave good results. This was the beginning of my study of the subject, the results of which I will now give.

In the earliest history of cotton weaving, it was found that by spreading a paste made up of flour and water on the warp yarns, the weaving was greatly improved. Later the demand arose for greater strength and elasticity in the warp, it was found that the addition of tallow or other oils to the size gave the necessary pliability to the yarns. This gave results that were perfectly satisfactory to the art at this time. However, as the improvement in the art of weaving continues, the demand for increased strength, elasticity, and pliability continues also, and our latest improvement, the automatic loom, makes the severest demand on the size mixer's ability. Work that hitherto gave perfect satisfaction on the plain loom, when put behind the automatic machine, developed defects in our warps not previously recognized. It is to meet this present condition that the size mixer must exert his utmost effort to keep the pace set by the modern speeds. I will now endeavor to name and describe the more common materials used in pure sizing only, as in this country sizing for weight is not practiced to any great extent.

First, in order of importance are the starches. Starch is of about 95 per cent. granulose and 5 per cent. cellulose. Viewed under the microscope, each kind of starch has its own characteristic appearance and can be readily distinguished by the form and size of the grains. The starch granulose which is, by far, the greatest part and most valuable to the size mixer, is covered by a thin coating of cellulose, this cellulose being practically the same substance as the cotton and wood fiber, with no value to the size maker. The starch grain when unbroken is insoluble in cold water. Although water can pass through the coating of cellulose to the granulose in the interior of the grain, none of this substance is able to pass through the shell until it is broken. It is to the variation in character and thickness of this outer shell of cellulose that the different results obtained from starches are due.

When starch is heated in water to a temperature varying from 149° for potato to 176° for corn starch the starch granules are broken and the mixture gelatinizes. It is very important when boiling the starch to remember that owing to the stiffness of the paste and the poor circulation of heat in the size kettle, it is difficult to burst all the starch grains, and those that are not broken are of little value to the mixing, being more than liable to be beaten off during the process of weaving.

When starch is treated with a cold solution of caustic soda or caustic potash the outer coating of the grain is dissolved and the starch is rendered insoluble in water. A very interesting experiment is to dissolve about four ounces of caustic soda in half a bucket of water and slowly add the starch, which will swell up at once and form a paste of great strength and tenacity. Starch paste so made does not lose any of its tenacity on being boiled. A number of sizing compounds are based on this action of caustic soda on starch.

Dilute acids have the effect of converting starch into dextrin and glucose or grape sugar. Starch so treated (the thin boiling kind), loses in strength, for its chief value to the size mixer is its capacity to form a paste. The above substances, while valuable to the finisher, have no place in the size kettle.

A few words now as to the properties of the various starches. First in number comes flour, a mixture containing starch and other substances, the most important of which are gluten, albumen, sugar and dextrin. It is rarely used in this country for size mixing, being much higher in price than some of the other starches and requiring an elaborate process of fermentation before becoming fit for use in size. It is almost exclusively used in England for heavy sizing there, as it has the property of fixing the China clay on the yarn to a greater extent than any of the other starches.

Second in order comes potato starch. This starch when of good quality and not adulterated with corn and other starches is most valuable to the size mixer on light and high pick goods, though all starch sold as potato starch should be carefully examined under the microscope before it is purchased. If I am not mistaken, the experiment station in Raleigh called our attention to this fact some time ago. Potato starch has one defect, that of growing thinner on repeated boiling. A mixing left over Sunday, on boiling up Monday is likely to make soft warps and thus cause trouble in the weave room. This can be remedied to a considerable extent by adding a small amount of caustic soda to each kettle of size.

Third in order, and most important to us, comes corn starch. Caustic soda also improves the size made by this starch, giving the yarn sized by it a

softness and pliability that could not be obtained without its use. In my opinion, it also prevents to a great extent the loom beating the size off the yarn in weaving. When I began using the caustic soda in my sizing, I found the cloth became heavier and I now find it necessary to run lighter numbers on my spinning to get the cloth down to the proper weight. In these days of fifteen-cent cotton, this is no inconsiderable item.

The last of the starches to be considered is rice. This starch is valuable to the laundryman but has no place in the size kettle owing to its harshness, brittleness and high price. Before leaving the subject of starch, I would like to emphasize the necessity of thoroughly boiling the size so that all the starch grains may be broken up. This will add greatly to the softness and pliability of the sized warp, and improve the weaving and feel of the goods. If caustic soda is used, I would suggest that it be dissolved in the amount of cold water to be used for the size mixing, adding the starch after the soda is thoroughly dissolved. On heating this mixture just before it comes to a boil, you will find that the starch forms a very stiff jelly, so thick that the stirrers are not able to revolve. After a few moments the size gets thinner so that the stirrers can again perform their duty.

The most important of the softeners is tallow. A good beef tallow with suet or bone and marrow fat is the best softener for pure sized goods. Other softeners of value to the sizer are cocoanut oil, palm oil, castor oil, turkey red oil, soluble oil or castor oil soap, Japan wax and paraffine wax. The last named wax should never be used on goods intended for bleaching as it is extremely hard to wash out and causes uneven bleaching and dyeing. The soaps both hard and soft are used in light sizing and are of considerable benefit in some cases. They can be made cheaper at the mill, for they all contain water in large proportions.

Next come those substances that give strength and pliability to the warp through their ability to absorb moisture from the atmosphere, the three most important being magnesium chloride, calcium chloride, and glycerine. The first two should be used very cautiously in a mixing, for they are liable to cause mildew and become decomposed in the process of singeing, forming hydrochloric acid, which "tenders" the goods. Glycerine is subject which "tenders" the goods.

The high price of glycerine prevents its more general use. Crude 80 per cent. glycerine is quoted at 20 cents per pound. When either of the three last named substances are used, it is sometimes necessary to use a disinfectant to prevent mildew, the more common materials being chloride of zinc, carbolic acid and salicylic acid. Just enough should be used to present trouble, as more only adds to the cost. One of the best slasher men I have ever known used a small quantity of blue stone or copper sulphate in his mixing. The chief value of this as a sizing ingredient is as a disinfectant, though he claimed he used it to make the yarn part better at the lease rods. I have never been able to find on what grounds he based his belief. Another substance used in sizing is Glauber salts. This has properties opposite to calcium chloride and glycerine, giving up its water of crystallization on exposure to the atmosphere, and imparting a stiff, boardy feel to the finished cloth.

Having described all the sizing ingredients with which I am familiar, I will draw a few conclusions as to what constitutes a proper size mixture.

Three elements enter into this question, the most vital being the obtaining of good weaving; next, that of cost; and last, the simplicity and ease with which the mixture can be prepared. I contend that between two size mixings giving the same results in weaving and costing the same, the simple one should be given the preference. The following mixing will give good results on print yarns:

Take the same amount of water as used in the regular mixing and dissolve in it one pound of caustic soda for 120 gallons. Add to this the usual amount of starch and tallow. If a large amount of compound is used and this appears to be of a greasy nature add one-fourth as much tallow in addition to the amount above mentioned as there is compound ordinarily used. Cook the size two hours before using, adding the tallow after the mixture boils. The only objection to the use of caustic soda is that it injures the woolen blankets on the slasher if too much is used. I have used as much as two pounds to 110 gallons of water for months, and have found no injurious effects from it. As to its effect on the cotton fiber, and the subsequent process of bleaching, all cloth is washed in a solution of caustic soda before being bleached.

The idea is prevalent that the size is put into the yarn by the immersion roll. I believe it is forced into the yarn by the pressure of the flannel rolls and that by increasing or decreasing the thickness of the covering a heavier or lighter sized yarn results; also that by putting on a heavier roll and increasing the thickness of the flannel a better finish will be put on the yarn. I have never had a chance to test this idea, as I have only the rolls furnished by the slasher makers.

Papers were also read by L. P. Hollis, of Greenville, S. C., on Industrial Education; Wm. P. Bear, of Charlotte, on the Care of Electrical Machinery in the Cotton Mill; R. L. Briggs, of Rockingham, on the Card Room. The discussion on "Card Settings" led by T. B. Wallace and W. P. Hurt proved very interesting.

It was decided that the next meeting should be held at Anderson, S. C., on July 1, 1911. Following is a list of the officers of this organization:

W. P. Hamrick, superintendent Olympia Cotton Mills, Columbia, S. C., president; Arthur T. Smith, superintendent Langley (S. C.) Manufacturing Co., vice-president; E. E. Bowen, overseer of weaving Great Falls Manufacturing Co., Rockingham, N. C., second vice-president; E. M. McEntire, superintendent Loray Mills, Gastonia, N. C., third vice-president; M. E. Stevens, superintendent Columbus Manufacturing Co., Columbus, Ga., fourth vice-president; G. S. Escott, Charlotte, N. C., secretary; David Clark, Charlotte, N. C., treasurer.

Personals.

Wm. K. Greer, who has been assistant superintendent of the Beaver and Eclipse Mills, North Adams, Mass., which mills were recently taken over by the Hoosac Cotton Mills, has been appointed superintendent to succeed Harvey Burnham, who has retired from active life. Robert W. Prentice, who has been in charge of the mill office for some time, has been appointed treasurer of these mills.

C. N. Bagley, superintendent of the Sheridan Woolen Mill, Ashuelot, N. H., has severed his connection with that company.

Frank Ferguson has been appointed superintendent of the White Rock Mill, White Rock, R. I. He comes from the Whitman Mill, New Bedford, Mass., and succeeds Howard Pember. He has for overseers: Melvin Leonard, overseer of weaving; F. E. King, overseer of carding; Daniel Fitzpatrick, overseer of mule spinning; John Vose, overseer of cloth room; Joseph S. Dudley, overseer of ring spinning and spooling and J. E. Briggs, overseer of the machine shop.

Frank P. Smith has been appointed overseer of weaving at the Hamilton Mfg. Co., Lowell, Mass., succeeding George Parker.

T. Carey has accepted the position as overseer of carding at the Woolen Mfg. Co., Beaver Dam, Wis. He comes from Yale, Mich.

John Jones has accepted the position as overseer of dressing at the Kent Mfg. Co., Centreville, R. I.

W. P. Hornbuckle, overseer of weaving at the Minneola Mfg. Co., Gibsonville, N. C., has resigned to accept a similar position with the Buffalo Cotton Mills, Buffalo, S. C.

J. J. Bates, overseer of spinning at the Washington Mills, Fries, Va., has resigned to accept a similar position with the Buffalo Cotton Mills, Buffalo, S. C.

Robert Pratt, overseer of carding at the Peerless Mfg. Co., Lowell, N. C., has resigned to accept a similar position in one of the mills at Monroe, N. C.

William Morrell, from Taunton, Mass., has accepted a position as overseer of spinning and spooling at the Longhurst Mill, Roxboro, N. C.

John T. Abney, superintendent of the Swift Mfg. Co., Columbus, Ga., has resigned to become secretary and treasurer of the same mill.

B. M. Aull, manager of the Pendleton Mill, Autun, S. C., has resigned, to become manager of the Fingerville Mfg. Co., Fingerville, S. C.

C. A. Sweet, Jr., from Atlanta, Ga., has been appointed superintendent of the Swift Mfg. Co., Columbus, Ga.

J. H. Bush has accepted the position as overseer of spinning at the Valley Creek Mills, Selma, Ala. He comes from Wesson, Miss.

Robert Lockhart, overseer of carding at the Central Mills, Griffin, Ga., has resigned to accept a position at Columbus, Ga.

Crawford A. Partelo, overseer of carding and spinning at the J. D. Clark Co., Rochdale, Mass., has resigned. He is succeeded by C. T. Booth of Somersworth, N. H.

W. J. Crowe, inspector of cotton for the Arnold Print Works, North Adams, Mass., has resigned to accept a similar position with the Hoosac Cotton Mills, North Adams.

Eugene H. Dorr has been appointed general manager of the Standish Worsted Co., Plymouth, Mass.

Richard B. Morrell, treasurer of the Binder-Morrell Co., manufacturers of upholstery goods at Allegheny Ave. and C St., Philadelphia, Pa., has severed his connection with that firm.

Alfred Sager, superintendent of the Arlington Mills, Lawrence, Mass., after completing 25 years of faithful service, was presented with a beautiful silver loving cup. The presentation was made by agent William D. Hartshorne. Mr. Sager responded in a most appreciative manner.

D. C. Finney, agent of the Lowe Mfg. Co., Huntsville, Ala., has severed his connection with that company. He is succeeded by Ralph L. Wilson, formerly with the Floyd Cotton Mills, Rome, Ga.

H. A. Wicks, overseer of dressing at the Continental Worsted Co., Providence, R. I., has resigned.

Edward F. Williams has been appointed superintendent and designer at the Hillsboro Woolen Mills Co., Hillsboro, N. H. He comes from the Middlesex Mill, Lowell, Mass.

Edwin Davenport, Jr., has been appointed overseer of dyeing at the Pitman Mfg. Co., Laconia, N. H., succeeding E. Thornton.

Daniel Green has accepted the position as master mechanic at the Queen City Cotton Co., Burlington, Vt. He comes from Fitchburg, Mass.

Edwin V. Livesey, manager of the Heywood Narrow Fabric Co., Fall River, Mass., has resigned.

Otto F. Seifert has been appointed overseer of dressing at the Langshaw Mill, New Bedford, Mass. He was formerly employed in a similar position at the Nashawena Mill, same city.

C. W. Everett has been appointed second hand in the weaving department at the Globe Woolen Co., Utica, N. Y.

F. W. Garvey has been appointed overseer of carding at the Dana Warp Mills, Westbrook, Me.

Walter E. Ross, overseer of weaving at the Forest Mills Co., Bridgton, Me., has resigned. He is succeeded by Carl A. Norberg, who was

formerly overseer of weaving at the Locustville Woolen Co., Hope Valley, R. I.

Chas. Gladstone has been appointed overeseer of carding at the Racine Woolen Mill, Racine, Wis.

John E. Doyle has accepted a position with the S. Sanford & Sons' Carpet Mills, Amsterdam, N. Y. He was formerly employed at the Smith Carpet Mills, Yonkers, N. Y.

F. H. Edgerton has accepted a position as boss weaver at the Garland Woolen Co., Staffordville, Conn.

C. C. Earnhardt has become engineer and master mechanic at the Entwistle Mill, Rockingham, N. C. He comes from Cordova, Ala.

A. V. Whiteside, overseer of spinning at the Victoria Cotton Mill, Rock Mill, S. C., has resigned to accept the superintendency of the Harris Mfg. Co., same place.

John A. Fowler has succeeded J. P. McNeill as superintendent of the Locke Mills, Concord, N. C. He comes from Bellwill Mill, Wilmington, N. C.

J. D. Beacham has resigned as overseer of weaving at the Ware Shoals Mfg. Co., Ware Shoals, S. C., to accept a similar position at the Chiquola Mfg. Co., Honea Path, S. C.

C. E. Hixon has accepted the position as overseer of spinning at the Tifton Cotton Mills, Tifton, Ga. He comes from Bath, S. C.

J. F. Lockey, formerly superintendent of the Wadesboro Cotton Mills, Wadesboro, N. C., but more recently overseer of the spinning in the Dickson Mills, Laurinburg, N. C., has been promoted in those mills to the position of assistant superintendent.

W. M. Hinson, from Stonewall, Miss., has accepted a position with the Laurens Cotton Mills, Laurens, S. C., as overseer of weaving.

J. B. Broadnax has accepted a position with the Springstein Mills, Chester, S. C., as overseer of spinning. He was formerly employed at the Arcade Mills, Rock Hill, S. C.

James A. Fowler has been promoted from overseer of weaving to superintendent of the Bellwill Mill, Wilmington, N. C.

Robert J. Freitag, secretary of the Steel Heddle Mfg. Co. of Philadelphia, who has been on his European trip for some months, returned on November 8th on the Kronprinzessin Cecilie.

Joseph H. Cookson, overseer of weaving at the Newmarket Mfg. Co., Newmarket, N. H., has resigned to accept a similar position at New Bedford, Mass.

Arthur C. Freeman, son of ex-Alderman Cyrus Freeman of Somersworth, N. H., has been appointed agent of the Farwell Bleachery, Lawrence, Mass., succeeding Kirk W. Moses.

Roland R. Kelly, for the past twenty years superintendent of the Williamstown Mfg. Co., Williamstown, Mass., has severed his connection with that company.

Isiah D. Marjerison, overseer of the combing department at the Arlington Mills, Lawrence, Mass., has resigned to accept a responsible position in a large mill. He is succeeded by Alfred Law.

F. C. Patterson, formerly superintendent of the Namquit Worsted Co., Bristol, R. I., has been appointed superintendent of the Wakefield Mfg. Co., Wakefield, R. I., succeeding W. F. Shaw.

Ernest Meyers, overseer of dressing at the Peace Dale Mfg. Co., Peace Dale, R. I., has resigned and is succeeded by Henry Rathburn.

A. K. Dougherty, superintendent of the Morton Mill, Fourth Ave. and River St., Paterson, N. J., has resigned and is succeeded by Mr. Clark.

J. A. Adams, superintendent of the Arcade Mills, Rock Hill, S. C., has resigned, to accept a similar position with the Springstein Mills, Chester, S. C.

J. C Keller, formerly superintendent of the Lula Mill, King's Mountain, N. C., has succeeded J. W. Jenkins as assistant superintendent of the mill at Pineville, N. C.

H. J. Forsyth, overseer of weaving at the Hamilton-Carhartt Mills, Rock Hill, S. C., has resigned, to accept a similar position at the Clinton Cotton Mills, Clinton, S. C.

A. J. Mauney has been promoted from the position of overseer of spinning to that of superintendent of the Tuckaseege Mill, Mt. Holly, N. C.

R. F. Dellinger has resigned as overseer of carding at the Gastonia Mfg. Co., Gastonia, N. C., to become overseer of carding and combing at the Cleghorn Mills, Rutherfordton, N. C.

J. E. Mehaffee has resigned as overseer of the cloth room at Canton, Ga., to accept a similar position with the Union Cotton Mills, Union, S. C.

C. E. O'Pry has accepted the position as overseer of carding at the Brogon Mills, Anderson, S. C.

H. H. Boyd has succeeded J. W. Kidd as superintendent at Pineville, N. C., his position now being that of general superintendent over the five mills of the Chadwick Hoskins Co., Charlotte, N. C.

Adolphus H. Landry has accepted the position as overseer of weaving at the Wakefield Mfg. Co., Wakefield, R. I. He was formerly employed at the Reliance Worsted Co., Norwich, Conn.

J. H. Lord, superintendent of the Concord Woolen Mills, Smyrna, Ga., has severed his connection with that company.

J. R. Wilson has resigned the superintendency of the Springstein Mills, Chester, S. C., to accept a similar position with the Camperdown Mills, Greenville, S. C.

C. W. Causey has been appointed superintendent of the Brogon Mills, Anderson, S. C.

John L. Gregson, formerly superintendent of the

German-American Co., Draper, N. C., has accepted the superintendency of the Barbour Cotton Mills, Eufaula, Ala.

Dave Wallace has accepted the position as overseer of dyeing at the Highland Park Mills, Rock Hill, S. C. He comes from Hillsboro, N. C.

J. G. Hamm, second hand in the carding department at the Walton Mill, Monroe, Ga., has accepted the position as overseer of carding with the Lawrenceville Mfg. Co., Lawrenceville, Ga.

J. C. Stewart has taken charge of weaving, slashing and drawing-in at the Fitzgerald Cotton Mill, Fitzgerald, Ga.

E. Welty, overseer of carding at the No. 1 Mill of the New York Mills, New York Mills, N. Y., has resigned.

Ralph Chase has been appointed overseer of dressing at the Livingston Worsted Co., Washington, R. I. He formerly held the position of dresser tender at this company.

Gustave Prevost has accepted the position as overseer of dyeing for the Sidney Blumenthal Company, Shelton, Conn. He was formerly employed at Raritan, N. J.

John F. Dunn, formerly superintendent of the Stillwater Worsted Co., Greenville, R. I., has accepted the position as designer at the Namquit Worsted Co., Bristol, R. I.

Ernest Vanderwalker has been appointed superintendent of the Whittenton Mfg. Co., Taunton, Mass., to succeed John B. Curtis.

Robert Dawson has completed his duties with the U. S. Worsted Co., Harrisville, R. I., to accept a position as superintendent of the Wolff Worsted Co., Harrisville.

Frederick Roeher, overseer of finishing at the Continental Worsted Co., Providence, R. I., has accepted a similar position with the F. L. Sayles Co., Pascoag, R. I.

R. L. Cumnock, Jr., who recently resigned as superintendent at the Brogon Mills, Anderson, S. C., has been appointed superintendent of the Cox Mills of the same place.

C. A. Singleterry, overseer of carding at the Shawmut Mills, Shawmut, Ala., has resigned.

K. C. Etters, overseer of weaving at the Gaffney Mfg. Co., Gaffney, S. C., has resigned, to accept a similar position in the large new mill at Great Falls, S. C.

W. Roland Holt, recently overseer of carding at Eagleville, Conn., has accepted the position of superintendent of carding and spinning at the Holt-Morgan Mills, Fayetteville, N. C.

L. W. Kirkman has been promoted from the position of overseer of weaving to that of superintendent at Rhodhiss, N. C., succeeding F. S. Mosher, who is now located in Charlotte, N. C.

John Maguire has been appointed overseer of finishing at the Sawyer Regan Co., Dalton, Mass., succeeding James Hillens.

Arthur Firth has accepted the position as overseer of carding at the New York Mills, New York Mills, N. Y.

Alex. MacMurray, Jr., has accepted the position as overseer of spinning at the Exeter Mfg. Co., Exeter, N. H. He was formerly employed at the Esmond Mills, Esmond, R. I.

W. C. Rodgers has again entered the employ of the Camden Woolen Co., Camden, Me., as superintendent and designer. He succeeds S. F. Sheldon.

Geo. K. Tate has resigned his position as overseer of spinning at the Opelika Cotton Mill, Opelika, Ala., to accept a position with the Roanoke Mills Co., Roanoke Rapids, N. C., as assistant superintendent.

J. T. Shirley, master mechanic at the Baltic Cotton Mill, Baltic, Conn., has resigned to accept a similar position with the Edwards Mfg. Co., Augusta, Me.

Robert McBride has accepted the position as overseer of spinning for The W. E. Hayward Co., East Douglas, Mass. He was formerly employed as second hand at the Middlesex Mills, Lowell, Mass.

Andrew E. Burnside, for several years superintendent of the Lynndon Worsted Mill, Camden, N. J., has resigned to accept a similar position with the Griswold Worsted Mill, Darby, Pa.

James P. Kennedy has accepted the position as overseer of dyeing for H. H. Wood & Co., Lakeport, N. H. He comes from Millbury, Mass.

John B. Curtis, superintendent of the Whittenton Mfg. Co., Taunton, Mass., has been appointed agent of the Atlantic Cotton Mills, Lawrence, Mass., to succeed the late Walter Summersby.

Thomas Pendergast has accepted the position as overseer of carding for the R. T. Sullivan Co., Newton Lower Falls, Mass.

Harold S. Bottomley has been appointed superintendent of the Lynndon Worsted Mills, Camden, N. J. He succeeds Andrew Burnside.

J. R. Jones, superintendent of the Bangor Silk Co., Bangor, Pa., has severed his connection with that company.

H. A. Wicks, overseer of dressing at the Continental Worsted Co., Providence, R. I., has resigned, and is succeeded by Thomas Parkin.

T. F. Cuddy has accepted the position as overseer of ring spinning at the Atlantic Cotton Mills, Lawrence, Mass. He was formerly employed at the Edwards Mfg. Co., Augusta, Me.

Irvin R. Libby, superintendent of the Borden Felt Mill, Millbury, Mass., has tendered his resignation to accept a similar position with the Lowell Felt Co., Lowell, Mass.

L. H. Dwyer has been appointed overseer of weaving at the Burlington Mills, Winooski, Vt.

Kirk W. Moses, Jr., superintendent of the Farwell Bleachery, Lawrence, Mass., has severed his connection with that company.

C. H. Miller, for 25 years connected with the engineering end of the American Thread Works, Holyoke, Mass., has resigned to become a member of the firm of Henry W. Bulkey & Co., Inc., of New York City, and Orange, N. J. This firm is engaged in the manufacture of condensers for steam engines and turbines.

Wm. J. Mason, overseer of ring spinning and spooling at the Atlantic Mills, Lawrence, Mass., has resigned his position. He was presented with a chain and charm by the employes.

Robert Parker, overseer of weaving at the Elm Mills, Tilton, N. H., for five years, has resigned and is succeeded by Ernest Nelson.

Wm. C. Sainsbury has been appointed first assistant designer at the Dunn Worsted Mills, Woonsocket, R. I. He was formerly employed at the National & Providence Worsted Mills, American Woolen Co., Providence, R. I.

David A. Longacre has been elected treasurer of the Argo Mills Co., Gloucester City, N. J., to succeed the late Geo. W. Grove.

James S. Garrett has accepted the position as overseer of the cloth room at the Lincoln Cotton Mills Co., Evansville, Ind. He comes from the Indian Head Mills, Cordova, Ala.

Thomas Pluff, overseer of finishing for F. L. Sayles Co., Pascoag, R. I., has resigned to accept a similar position at Philadelphia.

Byron L. Waterman, treasurer of the River Spinning Co., Woonsocket, R. I., has severed his connection with that company. He has not definitely decided on what he will do in the future.

Herbert Massey has accepted the position as overseer of dyeing at the Akers & Taylor Mfg. Co., Charlton City, Mass. He was formerly employed with the Brodfelt Worsted Co., Clinton, Mass.

James R. Lister is superintendent of Walworth Bros.' Mill at Lawrence, Mass. His assistants in the different departments are as follows: Herbert Bake, assistant designer; Seth Robinson, overseer of weaving; S. P. Chadwick, overseer of dyeing and wet finishing; Harry Begen, overseer of dry finishing and Austin Matthews, charge of shipping.

Wm. McGuire, overseer of spinning at the Whittenton Mfg. Co., Taunton, Mass., has severed his connection with that company to accept a position as overseer of spinning, spooling, warping and slashing at the Maverick Mill, East Boston, Mass. On his retirement from the Whittenton Mfg. Co., a pleasant gathering was held at his home, at which Luke Madden welcomed the guests and at the conclusion he introduced Richard Russell, toastmaster of the evening. In behalf of the overseers Mr. Russell presented Mr. Maguire with a cut glass water set, consisting of a pitcher and twelve glasses and a mahogany tray.

M. J. O'Brien, overseer of dyeing at the Brightwood Mfg. Co., North Andover, Mass., has been appointed a member of the Board of Commissioners for the Lawrence Industrial School.

Andrew F. Griffin, superintendent of the Wuskanut Mills, Farnumsville, Mass., who resigned to accept a position as superintendent and agent of the Hoosick Worsted Co., North Adams, Mass., was presented with a solid oak leather covered Morris chair, a parlor picture and a solid silver loving cup lined with gold, by the assistant superintendent, overseers and office help. Harry Daw, assistant superintendent and successor to Mr. Griffin at the Wuskanut Mills, presented the loving cup in behalf of the overseers and assistants to him, after which Frank H. Kennedy, in behalf of the employes of the mill, presented Mr. Griffin with the chair and picture. Mr. Griffin was completely taken by surprise, but managed to respond in a few chosen words thanking his associates and bidding them goodby.

DEATHS.

Samuel E. Hathaway, superintendent of the Fall River Iron Works Co., Fall River, Mass., died at his home in that city, November 16, at the age of 45 years. He had been in ill health for some time and underwent an operation recently. He was the son of Samuel W. Hathaway, for many years superintendent of the Stafford Mills. At the age of 23 years he was appointed superintendent of the Fall River Iron Works Co. He is survived by a wife, one son and a daughter. He was a thirty-second degree Mason, a past master of King Philip Lodge and a past commander of Godfrey De Bouillon Commandery, K. T. Out of respect to Mr. Hathaway, Mr. Borden ordered the mills to be closed on Saturday, the day of his funeral. The employes, however, did not lose their pay for the day. The following letter was posted in the mills:

"Fall River Iron Works Company.
"Fall River, Mass., Nov. 18, 1910.

"Samuel E. Hathaway, superintendent of these mills from the beginning, died Wednesday last at his home in this city.

"He was a man of extraordinary ability in his line. His devotion to my interests throughout the twenty years of his incumbency was unfaltering and unique. His loss is a personal bereavement to me, and his place can never be adequately filled.

"As a mark of respect to his memory, the mills of this plant will be closed on Saturday, Nov. 19, the day of his funeral.

(Signed) "M. C. D. Borden,
"President."

Walter Leroy Butterfield died at his home in Somersworth, N. H., of acute Bright's disease and heart trouble. He had been a resident of that city for many years, and was born in Lincoln, Vt., June 21, 1847. As the age of 17 he went to Manchester, N. H., and worked in a cotton mill. He afterwards returned to Somersworth and held a position as overseer at the Great Falls Mfg. Co. Later he associated himself with Lucas Briggs, a cotton mill manufacturer, and was afterwards employed at the Slater Mills, Sutton, Mass., as agent.

George H. Milner, for many years overseer of spinning at the Ashland Cotton Co., Jewett City, Conn., and also with the Dwight Mfg. Co., of Chicopee, Mass., died at his home in Valatie, N. Y., November 6 at the age of 51 years, of heart failure. Mr. Milner was well known and highly respected by all who knew him. He is survived by his wife.

Peter H. Brown, who organized the American Worsted Co. of Providence, R. I., some years ago and afterwards engaged in the worsted business on his own accord, died at his home, 203 Waterman St., in that city. He is survived by one son and three daughters.

Thomas Mullholland, manufacturer of cotton and woolen goods and whose mill was located at Adams and Church Sts., Philadelphia, Pa., died at his home in that city of acute indigestion at the age of 50 years. He is survived by two sons and three daughters.

John W. Brogden, overseer of carding and combing at the Geo. H. Gilbert Mfg. Co., Gilbertville, Mass., died at a Boston hospital after undergoing an operation. He was 35 years of age, and leaves a widow and one son. He had been employed for the above company for twelve years.

W. A. Shaul, formerly overseer of spinning at the Renfrew Mfg. Co., Adams, Mass., and who resigned there some time ago to start in the hotel business at Davenport, N. Y., died at Meredith, N. H. He was born at Herkimer, N. Y., in 1855, and leaves a wife and one son.

John C. Dowell, superintendent of the Phoenix Silk Mfg. Co., Paterson, N. J., died at his home, 181 Broadway, in that city, at the age of 73 years. He was born in Boston, Mass., and is survived by a widow and six children.

Warren D. Huse of Laconia, N. H., died at his home, November 20. Mr. Huse was very widely known in the knitting industry, having been a manufacturer of knitting machinery for over thirty years. He was a native of Vermont and would have reached his seventy-fourth year on Christmas day. He was the inventor of a number of knitting machines which have become standard in their line of work in this country. He had associated with him in business his two sons, Leon C. and Walter L., who survive him. He was a man of sterling qualities.

Hon. William Walker Foulkrod, president of the Frankford Hosiery Mills Co., Unity St., Frankford, Philadelphia, and a Republican member of Congress from the fifth Pennsylvania district, died Sunday, November 13, after an illness of several months. He was born in Frankford, Nov. 22, 1846. The funeral services were held from his late home, 4716 Leiper St., in that city.

Charles Francis Burnham, treasurer of the Crefeld Waste & Batting Co., Saylesville, R. I., and president of the L. A. Lockwood Co., Phillipsdale, R. I., died November 12, in his 57th year. Mr. Burnham was a Past Master of Barney Merry Lodge, a member of Pawtucket Royal Arch Chapter, Pawtucket Council, Royal and Select Masters, Holy Sepulchre Commandery, Knights Templar and Palestine Temple, Mystic Shrine. He is survived by his parents, three brothers and one sister.

John S. Collins, for many years manager of John S. Collins & Co., Gilsum, N. H., died at a hospital in Keene, N. H., at the age of 68 years.

Samuel P. Tucker, for the past nine years overseer of carding at the Cocheco Mills, Dover, N. H., died November 19. He was for several years connected with a cotton mill at Webster, Mass., and is survived by a wife and several children.

Adrian Foote, a well known citizen of Ashland, Mass., died at his home recently. He had been in failing health for some time, and was born in New Berlin, N. Y., Dec. 8, 1822. He was employed at the Dwight Print Works and was later made treasurer of the Warren Thread Co.

Hiram Whiting died at his home, 132 Alpine St., Franklin, Mass., after an illness extending about six months. He was 83 years of age and born in Wrentham, Mass. When he was 11 years old his parents moved to Blackstone, Mass., and afterwards to Woonsocket, R. I. He was superintendent, some years ago, of the Ray Mill, No. Bellingham, Mass., and held that position for 35 years, having resigned about 18 years ago.

Rufus P. Rankin, organizer of the Ozark Mills, Gastonia, N. C., and its president and treasurer until quite recently, died at his home in Gastonia, recently, after suffering for seven years from tuberculosis. He is survived by a wife and five children.

Charles P. F. Kellogg, of the firm of Charles P. F. Kellogg & Co., 68 Essex St., Boston, Mass., and one of the largest buyers of fine cotton goods and converters in the country, died at his home, Dorchester, Mass., on November 10.

Daniel Walker, 65 years of age, died at his home in Conway, Mass., after three attempts to commit suicide. He had charge of the spinning department of the old Delabarre Woolen Mill of Conway, which was operated as a woolen mill several years ago.

Farley W. Richardson died at his home, 15 Davis St., Cumberland, R. I. He was at one time assistant overseer of weaving at the Ann & Hope Mill, Lonsdale Co., Lonsdale, R. I., and is survived by a widow and two children.

Henry Rich, a retired woolen goods manufacturer, died at his home in Los Angeles, Cal., at the age of 72 years. He was a native of Vermont. He formerly operated a mill at Baraboo, Wis., and is survived by a wife and one son.

George Fred Davis, 52 years of age, died at his home in Laconia, N. H., as a result of an apoplectic shock sustained two or three days previous while engaged in duties as foreman of the knitting room at the Belknap Stocking Co., of Laconia, N. H.

A. P. Welch, treasurer and superintendent of the Welch Mfg. Co., manufacturers of Turkish towels at Glen Riddle, Pa., died suddenly at his home in that town.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

New Mills.

*Connecticut, Danielson. R. L. Fisher is treasurer of the Connecticut Mills Co., the new concern which has been reported as leasing Factory No. 2 at Industrial Place for the purpose of manufacturing automobile fabrics, and Wm. B. Fittz is secretary and manager. Fine Sea Island and Egyptian cotton fabrics will be made. The company is at present in a state of organization and will not be ready to begin manufacturing goods for some time.

*Georgia, La Grange. The new Dunson Mills will manufacture cloth. W. S. Dunson, who is to be superintendent and probably treasurer, will assist in buying the machinery equipment.

Massachusetts, Lowell. The new mills and additions under construction for the Massachusetts Cotton Mills will all be completed and in use by March of next year. The new equipment will include 52,672 spindles and 1,105 looms.

*New York, Jamestown. The Jamestown Towel Mills, incorporated early in October with capital stock of $5,000, have begun the manufacture of Turkish and huck and union huck towels with equipment of 24 looms. They bleach and finish the product. R. P. Stewart has been elected president and T. R. Sampson, treasurer. John T. Hall is agent and buyer. The product is sold direct.

*North Carolina, Rockingham. Machinery is now being installed by the Entwistle Mfg. Co. Buildings have been constructed and include a main mill of brick construction, 128 by 480 ft., and boiler and engine house. The initial equipment will consist of 20,000 spindles, 500 looms and a 650-h. p. steam plant. Forty-inch gray goods will be manufactured. Wm. Entwistle is president; Geo. P. Entwistle, secretary and treasurer, and W. B. Cole, vice-president and general mannager.

*North Carolina, King's Mountain. Everything is in readiness for the Pauline Mills to begin manufacturing. The building was completed several weeks ago and 32 looms have been set up and put in running order. Chas. E. Neisler is proprietor and will make a line of table damask.

*North Carolina, Salisbury. The mill for the Hambley Mfg. Co. will not be built until next spring. The company was formed some time ago, as noted, and has organized with C. C. Adams, president; D. L. Arey, vice-president, and G. F. Hambley, secretary and treasurer. Mercerized damasks will be made.

*South Carolina, Greenville. Building contracts for the new fine lawn mill will be awarded as soon as plans are completed by Lockwood, Greene & Co., Boston, who will probably be selected to take charge. A 2-story spinning mill will be built and a 1-story saw-tooth weave shed. The machinery will be furnished by New England machinery manufacturers who are interested in the project. The plant will be driven by electric power, about 1,500 h. p. being required. J. I. Westervelt, who will be manager, states that a final decision has not been made as to a site.

*Vermont, Brattleboro. The proposed equipment of the Fort Dummer Mills Co. is 35,438 ring spindles and 650 looms to manufacture fine lawns. Construction work will be started on the buildings as soon as possible, although no date has been set, and manufacturing will be begun just as soon as the buildings can be built and equipped. This work will be carried on as fast as possible. Organization has not as yet been effected, but Edward G. Chase of 4 Market Sq., Providence, the promotor, is in charge and will be the manager.

Enlargements and Improvements.

*Alabama, Eufaula. The installation of new machinery for the finishing of the goods of the Cowikee Mills has been completed.

*Alabama, Huntsville. New looms are being installed in the Abingdon Mills to replace old looms. There will be no further change and the report that new spindles would be added is incorrect.

Alabama, Selma. The Cawthon Cotton Mill has been purchased by W. D. McNeill of Fayetteville, N. C., and others, and will be operated under the name of the Helen Cotton Mill. The mill has been idle and for sale for several months and will probably require extensive repairs before manufacturing can be started. The plant contains 13,000 ring spindles, 50 broad and 350 narrow looms operated by steam power and it is reported that some new machinery will be added. Several months ago the old Estelle Cotton Mills were purchased by L. E. Jeffries and Wm. R. Meadows and are being operated under the name of the Valley Creek Mills. The purchase of the Cawthon plant insures a busy winter in the cotton mills in this city. Mr. McNeill will move to Selma in the near future and expects to begin manufacturing before the end of the year.

Georgia, Hartwell. The Witham Cotton Mills are to be taken over by a new company to be organized by John M. Geer of Easley, S. C., with capital stock of $125,000 and the eequipment will be increased from 6,000 spindles to 10,000 spindles. The plant is at present equipped to make fancy colored goods and has 186 dobby looms, dyeing and finishing plant, etc. Mr. Geer is president and

treasurer of the Easley Cotton Mills of Easley, S. C.

*Louisiana, New Orleans. The Lane Cotton Mills Co., a new corporation owning the Lane Mills, which were formerly included in the property of the Textile Mills Corp., will make denims and other fabrics for working men's wear and is in the market for looms. The company was organized under the laws of Louisiana with capital stock of $900,000, of which $450,000 is preferred and $450,000 common. The officers are S. Odenheimer, president; Maurice Stern, vice-president, and H. T. Howard, secretary and treasurer.

Massachusetts, New Bedford. Lockwood, Greene & Co. of Boston, have prepared plans for a 5-story brick cotton storage building, 90 by 100 ft., for the Soule Mill. The building will be erected at the foot of Sawyer St. They have also completed plans for a 2-story picker house, 64 by 95 ft., and for a waste house, 21 by 49 ft. The J. W. Bishop Co. will do the construction work.

*Massachusetts, Newburyport. About 15,000 new spindles are being installed in the Warner Cotton Mills, replacing old spinning room equipment as noted. When this installation is completed 20,484 ring spindles will be operated on 10s to 40s combed yarns.

Massachusetts, Williamstown. Extensive changes are to be made in the Williamstown Mill recently purchased from the Arnold Print Works by the Greylock Mills of North Adams, although full details have not been worked out. The plant may be left a carded yarn mill, but when laying it out provision will be made so that it can easily be changed over to combed yarns by the installation of combers and a fourth process of roving. Floor space will be left for such an installation. This will also enable them to run looms at Williamstown on fine goods such as are made in North Adams. When the changes are completed here and in North Pownal, Vt., the Greylock Mills will have over 100,0000 spindles.

*New Hampshire, Manchester. Contracts have been awarded by the Stark Mills for machinery equipment to make the extensive changes reported some time ago. The carding equipment is to be replaced by 360 new cards, while the old pickers will be replaced by entire new equipment. In the weaving department 500 new Northrop loms will be installed. When all these changes are completed the Stark Mills will be in excellent condition as far as machinery equipment is concerned.

*New Jersey, Bridgeton. About December 1 the removal of the plant of Geo. W. Preston Co. from Paterson to Bridgeton will be completed. As noted previously a new corporation has been organized with capital stock of $100,000 to enlarge the business. Geo. W. Preston is president, superintendent and buyer, and J. Warren Miller is treasurer. The equipment is to be increased from 15 looms to 30 looms and a bleach house is to be built and equipped before January 1. The concern manufactures Turkish towels, Terry cloth and Terry novelties, selling through Nathan & Greer Co., New York City. The new plant is to be operated by steam and electric power.

North Carolina, Durham. An order has been given by the Erwin Cotton Mills Co. for warpers to be installed in No. 4 Mill at West Durham.

North Carolina, Forest City. Ten napping machines have been installed in the Florence Mills. Recently a dyeing plant was installed. The company is now making napped outing goods, dyeing and finishing the product.

North Carolina, Huntersville. A bleachery is being built by the Anchor Mills and machinery will be installed for bleaching and finishing their product. They make ginghams, chambrays and shirt goods.

North Carolina, Lowell. It has been decided to increase the capital stock of the Lowell Cotton Mills from $100,000 to $450,000 for the purpose of making an addition of 10,000 spindles and 300 looms. Heretofore the company has manufactured yarns only and has 9,000 spindles in No. 1 Mill and 6,000 spindles in No. 2 Mill. J. C. Rankin is president and S. M. Robinson, secretary and treasurer.

North Carolina, Lowell. It has been decided to change the production of the Peerless Mfg. Co. from carded yarns to combed yarns and contract has been awarded for necessary combers and drawing equipment. No other changes will be made at the present time.

*North Carolina, Spray. Details of the contemplated improvements in the mills controlled by Marshall, Field & Co. have not been fully determined. James Simpson, second vice-president of Marshall, Field & Co., who has the matter in charge, states that their plans are only in process of development and have not yet progressed far enough to warrant announcing them.

*North Carolina, Weldon. No change in the products of the Shaw Cotton Mills, Inc., is contemplated and new machinery equipment is to increase the present output of 30s to 40s single yarns.

*Rhode Island, Providence. Plans for additional machinery to be installed in the new addition to the Grant Mills of the Hebron Mfg .Co. have not been completed. The addition referred to will be 2 stories high.

South Carolina, Camden. Electric lighting equipment is being installed throughout the plant of the Hermitage Cotton Mills.

South Carolina, Greenville. The water supply system of the Monaghan Mills has been completed and will supply water to the mills and the mill village.

*South Carolina, Spartanburg. No. 1 Mill of the Spartan Mills resumed manufacturing Nov. 2. This department was closed Sept. 1 for the purpose of installing six new boilers, which are now in use.

*Vermont, North Pownal. The Greylock Mills have not made a final decision as to the exact class of work the North Pownal Mills will be run on. The plant will become a part of the Greylock Mills and will be operated under the same management and eventually on the same class of

goods. It will no doubt be a weaving mill and if carded yarns are woven here for a while the whole mill will be laid out for combed work so that it will be an easy matter to put it on the class of goods made in North Adams.

Mills Starting Up.

Alabama, Demopolis. Arrangements are being made to start up the plant of the Elmore Mfg. Co. and it is likely operations will be started within a month or six weeks. Benj. F. Elmore, a local attorney, is interested in the company. He was one of the purchasers at the foreclosure sale last July.

Massachusetts, Boston. The Maverick Mills have started cotton through the pickers and will gradually start all the machinery as the stock is worked through the preparatory operations. There are 1,400 looms on which fine lawns will be made.

*Massachusetts, North Adams. The formal transfer of the Beaver and Eclipse Mills to the Hoosac Cotton Mills has taken place and both mills are again in operation. The new company has secured a charter with capital stock of $1,500,000 and has organized with the following officers: Wm. M. Butler, president; Robt. W. Prentice of North Adams, treasurer; N. B. Kerr of New Bedford, agent, and Wm. K. Greer of North Adams, superintendent. W. E. Benner of North Adams will represent the company as selling agent in New York. Mr. Prentice was formerly head bookkeeper of the mill and Mr. Greer was assistant superintendent.

*New York, Oswego. Chas. W. Becker of Amsterdam is starting up the mill of the Mohawk Mfg. Co., which he recently leased, simply as an enlargement of his manufacturing facilities in order to turn out a greater quantity of the general line he is manufacturing and in which he is dealing.

New York, Pleasant Valley. It is reported that Garner & Co. will start up the Pleasant Valley Cotton Mill on print goods. The mill has been idle since last April and has been offered for sale.

New York, Lestershire. The Corliss Towel Mills will soon be put in operation, with some change in the management, after an idleness of about six months. Crash towels will be produced.

WOOLEN.

New Mills.

*Connecticut, Dayville. A new corporation is to be formed by the men who owned the Glen Worsted Mills of Harrisville (sold to the Wolff Worsted Mills) under the style of the Glen Worsted Co., and the mill formerly ocupied by the Davis & Brown Woolen Co. has been leased. Five sets of cards and 28 looms will be operated. Bacon & Co. will continue as selling agents and the manufacturing will be under the direction of W. K. Litch, as in Harrisville. The new concern expects to begin manufacturing about December 1.

*Connecticut, Phoenixville. The new carpet mill reported last week from Eastford will manufacture Axminster rugs under the style of the Phoenix Carpet Co. James H. Walsh and Thos. P. Mellody are the men interested. The report that J. P. Walsh, formerly superintendent of the Norfolk Mill at Dedham, is interested is incorrect. The new company will equip a dyeing department for dyeing yarns and the plant will be operated by water power.

*Massachusetts, Lawrence. The new so-called merino yarn mill of Wm. Whitman Co. is roofed in and the property is being enclosed by a fence. About 30,000 spindles and preparatory equipment are to be installed for making worsted and merino yarns on the French system. Operations will be started about March or April, 1911.

*New Jersey, Passaic. It is expected the new Passaic Worsted Spinning Co. will begin manufacturing about April 1, 1911. As noted previously, buildings are now under construction and it has been learned that the equipment will be 12 combs, 12 cards and 10,000 spindles for making 16s to 50s yarns on the Bradford system. The plant will be operated by steam power. The new corporation has capital stock of $600,000. Eugene Ruckdeschel is president; Otto Bruckner, treasurer, and Alpha Garth, agent, superintendent and buyer.

*New York, Poughkeepsie. Joseph Jagger has not completed his experiments with his new rug weave and has made no arrangements for the further equipment of his plant. He has patents pending for a new high pile Wilton rug. He has one loom and has assembled all parts to work out the new fabric. Up to the present he has spent several thousand dollars on his invention and further developments are yet to be made.

*Washington, Washougal. Part of the machinery equipment for the Union Woolen Mills has arrived from Union, Ore. The frame work of the new mill is completed and the company hopes to be operating in part within a short time. Frank J. Bailey is president.

Enlargements and Improvements.

*Connecticut, New Boston. The mill to be started up by the Fabyan Woolen Co. is undergoing numerous changes such as new looms being installed and the work will require some time for completion. The plant will consist of five sets and 80 narrow looms.

Connecticut, Stafford Springs. Boilers are being installed in the new power house of the Warren Woolen Co. The work is being done by contractor Joseph Jones of Willimantic.

Maine, Corinna. Burrill & Clark, manufacturers of cotton warp cassimeres on 4 sets and 28 looms, are installing new machinery to largely increase the output.

Maine, Sanford. The Goodall Worsted Co. has purchased land on which they intend to erect a large reservoir to store water from driven wells for their dye house. The reservoir will hold 1,000,000 gallons.

*Maine, Waterville. The Wyandotte Worsted Co. has installed 4 new sets of cards and is moving the old cards to the new building and repair-

ing them. This will make an 8-set mill. Night work has been stopped for the present.

Massachusetts, Lawrence. The Lawrence Dye Works have placed their order with the Rodney Hunt Machine Co. of Orange, Mass., for the complete equipment of wet finishing machinery to be used in their new mill. This covers fulling mills, washers and dyeing machines. The new mill will be equipped throughout with the most modern machinery.

*Massachusetts, Medway. It will be some weeks before the Fabyan Woolen Co. will operate the Sanford mill in full. A new dye house is being built. When everything is in readiness the plant will consist of five sets and 70 broad looms with complete dyeing and finishing plants.

Massachusetts, Pittsfield. Two new mules have been installed by the Pontoosuc Woolen Mfg. Co. to replace old equipment. A new set of cards is also being set up.

*Massachusetts, Winchendon. E. M. Wright has the contract for the repairs on buildings recently purchased by the Union Shoddy Mills and work is now in progress. A new dam is to be put in, steel flume, new wheel pit and one new water wheel.

*Massachusetts, Worcester. No new machinery equipment is to be installed by the Worcester Woolen Mill Co. in the addition to the plant. The new space will be used for office purposes and enlargement of the weaving department, a rearrangement of the equipment following the completion of the addition.

*Minnesota, Fergus Falls. The new mill of the Fergus Falls Woolen Mills Co. is nearing completion. The old mill is to be shut down December 24 and the machinery equipment moved to the new mill. Manufacturing will be resumed just as soon as this change can be completed.

New Hampshire, East Rochester. Two new cards of the latest type have been added to the equipment of the Cocheco Woolen Mfg. Co.

*New Hampshire, Newport. Manufacturing has been resumed by the Brampton Woolen Co. after a shut down of ten days while machinery was being moved into the new building. The new mill contains 64 broad looms, an increase of 22 over the old equipment. This increase with other changes gives about 50 per cent. increase in production.

Pennsylvania, Philadelphia. A large tank on the top of the Penhirst Mills at Angora recently fell from the roof and completely demolished the power department of the mill and severely injured the engineer. The damaged portion of the plant is now being repaired and new engines installed and it is expected that the plant will be in operation again by the 1st of December next. Richard Shapcott, the proprietor of the mill, has been running it on woolen knitting yarns and roller coverings, and also scoured wool on commission. The plant contains 2 sets wool cards, 650 mule spindles, 4 broad and 3 narrow looms.

Pennsylvania, Sharpsburg. The Diamond Felt & Mfg. Co. contemplates taking up the manufacture of woolen felts and would like information on the manufacture of this class of goods. At present they manufacture hair felt on two cards. The capital stock is $30,000. John B. d'Homergue is president and John G. Wertz is treasurer. They employ about 20 hands.

*Rhode Island, Bristol. Excavating for the foundation of the 4-story addition to be built by the Cranston Worsted Mills has been started. It is intended to rush the work to completion.

Rhode Island, Bristol. An addition, of wood construction, is to be built on the south side of the mill of the Namquit Worsted Co. Dwelling houses now on the site of the addition are to be torn down.

Rhode Island, Providence. The Paragon Worsted Co. of Woonsocket has purchased the plant of the Earnscliffe Worsted Mills, which contains 70 broad and 2 narrow looms, and will begin manufacturing in the new quarters November 28. The Woonsocket mill, which they have operated under a lease, will be shut down. The plant at Woonsocket contains only 26 looms and the output is insufficient to supply the demand for their goods. Previous attempts to dispose of the Earnscliffe plant have been unsuccessful owing to the fact that the Earnscliffe mill is built on leased land and the lease has only about a year to run and a renewal could not be effected. Whether the Paragon Co. has arranged for a removal of this lease is not known.

*Tennessee, Knoxville. Additions and improvements are being planned by the Knoxville Woolen Mills. At least one addition is proposed and additional machinery equipment will be required. As noted early in the month, the concern closed the plant preparatory to making some changes to manufacture a new line of goods.

Wisconsin, Racine. The Racine Woolen Mills have resumed manufacturing after a shutdown to install electric lighting equipment.

Mills Starting Up.

Massachusetts, Hinsdale. Preparations are being made to start up the Hinsdale Woolen Mills which have been shut down for a few weeks. Wool blankets are the product.

*Massachusetts, Uxbridge. Lawrence Keegan will operate the Rivulet Mill, but no details can be given at the present time. Mr. Keegan, who is a woolen manufacturer of Wilsonvile, Conn., purchased the property at the recent auction sale for $8,750.

Massachusetts, Ware. The Ware Woolen Mills of Chas. A. Stevens & Co. will reopen Monday. The plant was shut down in July and since then two new boilers have been installed to replace two old ones.

Virginia, Basic City. On November 1 manufacturing was started by the Basic Woolen Co., successors to the Blue Ridge Woolen Co. Wool

blankets and automobile robes are made on 4 sets of cards and 37 looms. The new company has capital stock of $50,000. Wm. H. Gardner is treasurer and Hiram Dawson is general manager and buyer.

KNIT.

New Mills.

*Canada, Ontario, Brantford. Penmans, Ltd., of Paris, Ontario, has awarded contract for the construction of the proposed new mill. It will be 4 stories high with basement and when equipped will give employment to about 300 hands. The cost of the new mill will be approximately $50,000. Tindall & Co. of Woodstock, Ontario, will do the construction work.

Canada, Ontario, St. Thomas. The branch plant of the Monarch Knitting Co., Ltd., Dunnville, to be located in St. Thomas, will do both knitting and finishing and will be similar to the branch at St. Catherine's, Ontario. All business will be done at the main plant at Dunnville. This company manufactures sweaters, shawls, fancy knit goods, lumbermen's socks, etc. J. A. Burns is treasurer and buyer.

Canada, Ontario, Toronto. On December 1 a new concern known as the Crown Hosiery Co. will begin manufacturing men's and women's cotton, lisle and cashmere hosiery, operating by electric power. The new company is controlled by C. and A. G. Clark, knit goods manufacturers' agents, 711 Empire Bldg., 64 Wellington St., W., Toronto. Orders have not been placed for all the necessary equipment.

*Michigan, Grand Rapids. Organization of the new knitting mill will be completed December 3. One hundred thousand dollars has been subscribed and a seamless hosiery mill will be established. E. A. Clements, president of the Globe Knitting Works, heads the project and the men associated with him are John Snitsler, H. M. Liesveld, treasurer of the Globe Knitting Works, H. B. Herpolsheimer, Christian Bertsch and Dr. S. Porter Tuttle. A successful future seems to be assured for this project as Messrs. Clements and Liesveld have had exceptional success in the Globe Knitting Works in the manufacture of men's, women's and children's underwear.

Minnesota, St. Paul. J. Weis, 700 St. Peter St., previously reported as to manufacture a wool ribbed seamless "ankle warmer," has not started manufacturing as yet. He is looking for a knitting machine, hand preferred, for ribbing round or tubular and starting and ending with open taper.

New York, Oswego. James A. Shufelt, formerly superintendent of the Swits Conde Mill, will start a new knitting industry in Oswego. A 3-story mill, 50 by 60 ft., with separate power house, will be built and about 150 hands will be employed. Later it is expected a second mill will be built. A company will be organized with capital stock of $40,000. Knit underwear will be the product.

*Pennsylvania, Boyertown. Daniel Hartman has completed his knitting mill on which building operations were started in the spring and has begun manufacturing children's underwear under the name of the United Underwear Mills. He has engaged Samuel R. Knouse as superintendent and buyer. Seven kniting machines and 9 sewing machines are operated.

*Pennsylvania, Easton. Keiper & Keller established the small underwear plant on Spruce St. in which they were repeorted interested and began manufacturing ladies' Swiss ribbed vests. The plant is at present closed, but they expect to start it up again. They have have five knitting machines and three sewing machines.

*Pennsylvania, Easton. Some of the machinery equipment has been set up in the plant of the Easton Knitting Mills Co. and preparations are being made to begin manufacturing in a few days. This concern will manufacture men's, women's and infants' hosiery on 74 knitting machines operated by steam and electric power. A. J. Bowers is president; Bast Reading, treas.; O. Paul Kaffke, secretary and manager, and Harvey Shantz, superintendent.

Pennsylvania, Philadelphia. The Atlas Knit Goods Company, with William Gilbert as proprietor and office 518 E. Walnut Lane, Germantown, will start up in the manufacture of fine full fashioned, hand knit sweater coats with 6 knitters on or about January 1. They will buy worsted yarns 2/10 up to 2/20s and French spun yarns. The product will be sold direct.

*Pennsylvania, Landingville. The Landing Knitting Co. has begun manufacturing women's underwear on 8 knitting machines and 12 sewing machines, using 22s to 24s yarn. A. D. Warmkessel is president; C. A. Warmkessel, treasurer, and H. W. Fehr, buyer. The plant is operated by steam power.

Pennsylvania, Reading. It is reported Chas. W. Herbine will soon start up a plant for the manufacture of hosiery with a company having capital of $25,000.

Pennsylvania, Wind Gap. The Wind Gap Knitting Co., Inc., has begun manufacturing ladies' and misses' underwear with six knitting and ten sewing machines, operated by electric power. The plant is equipped with a bleachery. John T. Bowes is president; Wm. H. Rahn, treasurer, and Edward F. Wentworth, general manager and buyer. The capital stock is $5,000. Lamson, King & Co., New York, are the selling agents.

Enlargements and Improvements.

Illinois, Chicago. A 4-story addition is being built to the plant of the Lorenz Knit Goods Mfg. Co. on Belmont Ave. and two additional stories are being built on the original mill. It is estimated the additions to the building will cost about $35,000 and that $20,000 will be expended on new equipment. They manufacture sweaters, sweater coats and fancy knit goods. Richard Lorenz is superintendent and buyer.

Massachusetts, Canton. Draper Bros. Co. have had plans and specifications prepared by F. W.

Dean, mill engineer and architect of Boston, for a 2-story addition, 100 by 65 feet, to be used for manufacturing purposes. Bids for construction work will be received shortly.

*Massachusetts, Chicopee Falls. Work will not be started on the proposed addition for the Taylor, Bramley Co. until the last of January, but they plan to rush the work and have the addition in operation by the middle of March. The same class of goods will be made that is now manufactured. The firm attends to the buying.

Massachusetts, Malden. The Holmes Knitting Co. contemplates the erection of a 3-story addition which will more than double the present capacity. New machinery will be required. The details of the building and of new equipment have not been worked out, as it is improbable construction work will be started before spring.

Missouri, St. Louis. The Sexton Mfg. Co., of Fairfield, Ill., has purchased a 4-story building at Ewing and Clark Aves. for $25,000 and is making alterations preparatory to moving into it. Among the changes being made is the erection of an enlargement which will give about 20,000 square feet of space. The concern manufactures sweater coats, and ribbed webbing for seams for jean drawers, operating 20 knitting machines and 300 sewing machines in Fairfield.

*New Hampshire, Lakeport. An increase will be made in the yarn production of H. H. Wood & Co., following the completion of the addition of another story to the mill, the new space being designed for two 300-spindle mules, which will give them a full ten-set mill. They expect construction work will be completed in a few days.

New Jersey, Riverside. The Henry Taubel & Son Knitting Mills, in which they manufacture seamless mercerized half hose and women's hosiery, have increased their equipment to 108 knitters, 13 ribbers and 14 loopers. They dye and finish their own product and sell through New York. Henry Taubel is the buyer and superintendent. They report a fair business.

*New York, Long Island, Union Course. The new knitting mill of D. Nusbaum & Co., at present located in Brooklyn, is being built at Union Course and will be completed about January 1. It will be operated on sweaters, bathing suits, jerseys and underwear from 2/18s, 2/20s and 2/30s worsted yarns. D. Nusbaum & Co. have capital stock of $95,000. D. Nusbaum is president and M. Katzenberg is treasurer. Mr. Nusbaum attends to the buying. In the new plant the machinery will be driven by electric power.

*New York, Oswego. The Lastlong Underwear Co. is moving its machinery equipment to the new building recently completed. Manufacturing will be resumed in about two weeks.

New York, Utica. A small concrete structure is being erected by the Avalon Knitwear Co., to be used as a waste house. The building is to be 24 by 30 ft., 1 story and basement.

*New York, Utica. The new Kendall Mill of the Frisbie & Stansfield Knitting Co. is to be ready for occupancy by April 1. As noted previously, contract has been let to Henry Kassing and George Shippy of Utica.

*New York, Utica. The new mill of the Fort Schuyler Knitting Co. on Kemble St., which was started last April with the idea of completing before the expiration of the lease of the property at First and Jay Sts., which they occupied, is practically completed and machinery equipment is being moved in from the old plant. The mill is a 3-story structure and cost $26,000. The knitting room will occupy the top floor. The finishing room will be on the second floor and the office on the ground floor. The machinery will be operated by electric power and the mill will be electric lighted.

New York, Whitesboro. The 3-story addition which has been under construction for the Anchor Knitting Mills since last June has been completed. As noted in an earlier report, the building will be used for storage only for the present. There is a possibility that some machinery may be installeed in the spring.

*Ohio, Cleveland. N. J. Rich & Co. will more than double their equipment in the spring when they move into the new mill being built on Euclid Ave. at East 61st St. S. S. Sampliner is buyer.

Pennsylvania, East Stroudsburg. An addition, 28 by 44 ft., is being built to the Pocono Hosiery Mills, A. W. Kistler, proprietor, and the production will be increased by the installation of new equipment to be installed as fast as help can be secured. Details of the proposed new equipment are as yet undecided. The concern manufactures men's, women's and misses' hosiery, operating by steam power and dyeing and finishing the product.

Pennsylvania, Philadelphia. The Puritan Knitting Mills of Pennsylvania, which started up several months ago at 5th and Chestnut Sts., with 16 knitters and 12 sewing machines on which they manufacture ladies', men's and boys' sweater coats and Shaker knit coats, are arranging for the removal of their plant to 61 and 63 North 2d St., more room being needed in which to conduct their operations. Their production is sold through J. J. Armstrong, 366 Broadway, N. Y. The owners of the plant are Titelman & Newman, Mr. Newman being the superintendent and buyer.

Pennsylvania, Philadelphia. The German American Hosiery Co., whose office and finishing department are at Lawrence and Luzerne Sts., and knitting mill at Cambria and Ormes Sts., have increased their capital to $350,000 and also enlarged their equipment, the plant now containing 100 full fashion machines, 50 latch needle knitters, 75 sewing machines and 37 loopers, which are operated on ladies' and misses' fine cotton, lisle and silk hosiery, plain and ribbed full fashioned goods, which are sold through New York, the company doing its own dyeing and finishing. Robert Meyer is the president; Michael Rummer, treasurer, and Reinhard Huettig, superintendent and buyer.

*Pennsylvania, Philadelphia. The new 7-story mill of the Roxford Knitting Co. will be completed and equipped about June, 1911. It will have 300 knitting and 450 sewing machines operated on men's and boys' balbriggan underwear.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Weave Room Management; by Albert Ainley; 59 pages, 5 by 7; published by the author. Price $1.

The author of this book is a practical weaver, being at present employed as an overseer of weaving in one of the leading worsted mills of New England. What he writes is based, not on theory or second hand information, but on practical experience. The information he gives the reader in this book has been obtained by a study of the subject at first hand. He first discusses the general management of a weave room, which in many respects presents greater difficulties than does any other department of the mill. Next come chapters on the following subjects: The Loom Fixers; The Warp Starter; The Weavers; Filling Carrying; The Percher; Keeping the Rooms Clean; Before the High Court in the Finishing Room; Starting in at a New Place; Stimulating an Interest in the Production; Other Ways of Helping the Production; Chain Drafting; Clerical Works; Looking Out for Supplies; Yarn Calculations, etc. The work is a useful hand-book for not only the overseer of weaving and the loom fixer, but for the superintendent and those who desire to fill any of these positions.

Textiles; by William H. Dooley, Principal of the Lawrence Industrial School, Lawrence, Mass.; 221 pages, 5 1/2 by 8; D. C. Heath & Co., Boston, Mass. Price $1.

The author of this book is well known to our readers as the founder and principal of the Lawrence Industrial School, which, in the first two years of its existence has demonstrated beyond question its great value as a means of training the youth of Lawrence for those occupations in which the population of that city is principally engaged. Mr. Dooley discovered at the beginning of his work the great need of text books written in plain language as free as possible from technicalities and suited for those beginning a career in the textile and allied trades. This led him to compile detailed instruction papers for the students. Beginning then with these papers he has added much general material relating to textiles and the result is this volume, which will be of great value, not only to mill workers, but to students of the industry everywhere.

"Textiles"; by A. F. Barker, M. Sc., and others; 375 pages, 5 1/2 by 8; D. Van Nostrand Co., New York. Price $2.

The object of the author of this book has been to give, with slight exceptions, a review of the entire range of textiles. As a result much of the detail of the subject has been omitted. Following is an abstract of the contents: The History of the Textile Industries; The Wool, Silk, Cotton, Flax, etc., Growing Industries; Mercerized and Artificial Fibers; The Dyeing of Textile Materials; The Principles of Spinning; Processes Preparatory to Spinning; The Principles of Weaving; The Principles of Designing and Coloring; The Principles of Finishing; Textile Calculations; The Woolen Industry; The Worsted Industry; The Cotton Industry; The Linen Industry Historically and Commercially Considered.

The book will prove especially useful to the general student of textile manufacturing. At the same time it contains much that the mill worker will find valuable.

The Chemistry of Tape Sizing; F. J. Cooper, Science Master, Nelson Technical and Secondary Schools, Nelson, England; 107 pages, 5 by 7; published by the author. Price $1.50.

This book has been written for mill workers and is the outcome of a course of lectures delivered to the Nelson, Colme, and District Union of Tape Sizers. It is written in plain language, free from all unnecessary technicalities, and is designed to give those in charge of sizing much needed knowledge of the chemistry relating to their occupation. The subject is treated under the following heads: Description of Apparatus Used for Testing Sizing Ingredients, Indicators, Chief Chemicals Required. Simple Tests for Purity and Value of Size Ingredients; Flour, Farina, Sago and Starches Generally. Tallow, Soap, Glycerine, Wax and Other Softeners. Metallic Chlorides and Antiseptics. Clay. Detection of Adulterants in Sizing Materials. Analyses of Sizes. Fermentation, Mildew, Stains, etc. Weighting; Finding Per Cent. Water and Per Cent. Ash in Substances. Chemical Tests for ing Sizing Ingredients for Common Impurities.

Business Literature.

Counting Machine; C. J. Root Co., Bristol, Conn.

The various types of counting machines manufactured by the C. J. Root Co. are described and illustrated in this catalogue which also contains a view of the works where the machines are made. The Root counters are known as the "Bristol," "Elm City," and "Ro-co." They have been long in use and proved their worth beyond question. They register revolutions or strokes, count by the pair, dozen or gross and range in capacity from 100 to 10,000,000. They are rapidly winning their way into the textile industry, the following extract from the booklet bearing on their use in textile mills:

"Our counting machines have proved to be an appliance of great value to textile mills in automatically recording the product of a wide variety of machines, such as rolling and folding machines, slashers, looms, water mangles, printing machines and tenter frames. On the loom they record the number of picks woven. This system of counting picks is generally employed on the Continent of Europe, and the weavers are paid by the number of thousand picks, thus eliminating from the calculation the length of the goods and the picks per inch. A number of large cotton mills in the United States have adopted this system and found that it worked very satisfactorily.

"On machines delivering cloth the yardage is readily indicated by our counters, all that is necessary being to adapt the gearing to suit the delivery roller so that the counter will indicate the units of production. The principle of the counting

machine is embodied in the clocks on the mules and in the indicators on spinning frames, both of which are indispensable. The use of the Root counter is simply an application of this important principle to the product of other machines."

Some Positive Practical Evidence. Bulletin 34. Carbolineum Wood Preserving Co., 182 Franklin St., New York.

This bulletin contains photographic reproductions of letters received from users of Avenarius carbolineum. The letters supply convincing evidence of the value of this material as a wood preservative.

Farm and Home Uses. Bulletin 33. Carbolineum Wood Preserving Co., 182 Franklin St, New York.

A 40-page pamphlet explaining the various uses of Avenarius carbolineum in the home and on the farm. Many testimonials from users of this product are given.

Power Transmission Machinery.

John D. Sells, general manager of the Royersford Foundry and Machine Company, has just returned from a three months' business trip to Europe, where he went to extend their connections for the sale of the Sells Roller Bearing and the general line of power transmission machinery made by his firm.

They have opened a branch at 149 Queen Victoria St., London, E. C., in charge of Mr. Theodore Butler, where they will carry a very large stock of power transmission machinery.

Mr. Sells reports business at home and abroad as exceptionally good, for in spite of their having erected an additional building, 50 by 150 feet, they are compelled to run twenty hours a day in order to meet the demand for their product.

Cheaper Packing Cases.

A number of manufacturers have investigated the claim made by Peart, Nields & McCormack Co., Harrison Bldg., Philadelphia, which they have been advertising, to the effect that they can quote prices which will reduce the cost of packing cases materially if purchased from them in shook form. Since their advertisement has appeared they have received many inquiries from manufacturers and have a number of orders for carload lots from manufacturers who have found the saving to be well worth while.

The Leeds University.

Fenwick Umpleby, principal of the Bradford Durfee Textile School, Fall River, Mass., has been appointed by the Leeds University Textile Students' Association one of the Council for the United States. Prof. Umpleby wishes to communicate with any of the old students who may be residing in the United States or Canada.

Those who are interested in the old Yorkshire College and the Leeds University will find it to their interest to send their addresses to the principal of the Bradford Durfee Textile School, Fall River, Mass.

Sizing of Vegetable Fibers.

The Seydel Mfg. Co., 81 Steuben St., Jersey City, N. J., have a few copies left of a pamphlet on this subject, which is of interest to cotton superintendents and overseers of weaving. It contains some valuable suggestions and was very favorably commented upon at the spring meeting of the National Association of Cotton Manufacturers where the paper was originally presented. Those interested in this subject may procure a copy of this pamphlet without cost upon application to the company.

Underfeed Stokers.

The Solvay Process Company of Detroit, Mich., have recently ordered five additional Taylor gravity underfeed stokers to be applied to the heating processes in their plant. This is the third order received within the past five months from the same company for these stokers to be used under these furnaces, showing that the results are highly satisfactory.

The Taylor stoker is manufactured by the American Ship Windlass Company of Providence, R. I.

Soluble Softening Oil.

The Arabol Mfg. Co., 100 Williams St., New York, manufacturers of Soluble Softening Oil, report that especially fine results are observed from the use of this oil on close woven goods, such as corduroys, velveteens, sateens, umbrella cloths, cambrics, etc. Manufacturers who use tallow as a softener will be interested in noting the smooth finish of the warps treated with Soluble Softening Oil, the easy parting of the threads in the lease rods, and the clean and bright appearance of the slasher cylinders. It remains sweet, uniform and pliable at all times, not being affected by the climatic changes. It is neutral and blends easily.

Boston Office.

The manufacturers of the Taylor gravity underfeed stoker, The American Ship Windless Co., of Providence, R. I., have removed their Boston office to the Delta Building, 10 Post Office Square, where they will have increased facilities for serving their New England customers.

The Gotham Underwear & Bleach Works of Hamburg, Pa., S. D. Bauscher, proprietor, is now one of the largest knit goods bleacheries in the state of Pennsylvania. Its capacity during the last year has been almost doubled and it is now equipped to handle from 12,500 to 15,500 pounds daily. Good work and prompt deliveries have built up this business very rapidly.

The American Moistening Co. are installing a large system of their Comins Sectional Humidifiers in the Cleveland Worsted Mills at Cleveland, Ohio.

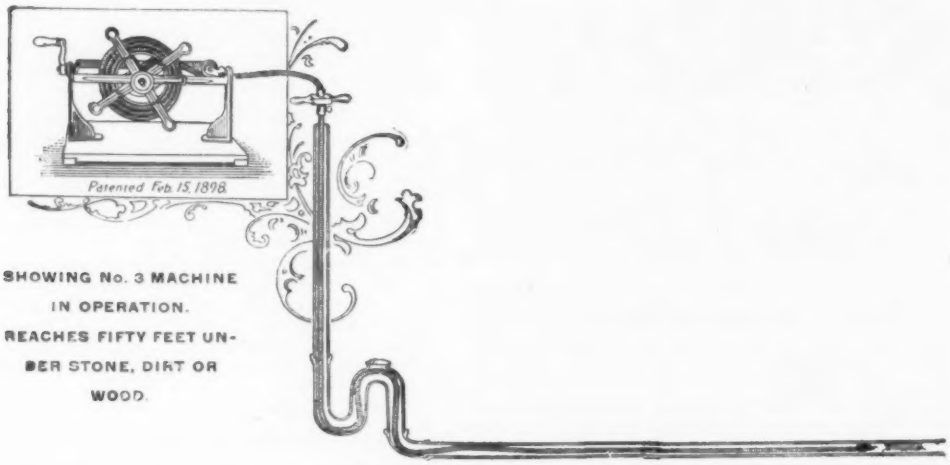
A Flexible Drain Pipe Cleaner.

No matter how well designed or well installed the plumbing may be, there are always occasions when the waste pipe clogs and trouble results. When this happens there always has to be a guess as to where the stoppage has occurred. If under a wooden or concrete floor the guess is usually about twenty-five feet from the mark and then begins the job of digging holes or taking up planks or tapping pipes. After the fifth or sixth try the trouble is finally located after a good deal of expense and much vexation of spirit.

Probably many men already know that there is a machine on the market known as Wrigley's sewer cleaner, which saves most of this trouble

and expense. It appears to be a very simple device and any handy man about the mill need not be a skilled mechanic to operate it. He takes the machine to the trap, enters it, feeds it along the pipe, in which it follows the bends and curves. The manufacturer says there is no waste pipe of any diameter, no matter how sharp the turns may be, that the Wrigley auger will not pass through to reach the obstruction, be it copper, paper, tin, glass or iron, and quickly bring it back to the point where the operator stands.

This seems a pretty strong statement, but he also says there are about 80,000 of these machines in all parts of the world doing this work every day. Samuel Lewis, 5 Front St., New York City, is the manufacturer, and he stands back of his guarantee and will refund the money if it does not do what he claims. The illustrations show how it works and his booklet makes it even plainer.



FLEXIBLE DRAIN PIPE CLEANER.

Alumni Association.

A number of the graduates of the New Bedford Textile School, residing in New Bedford, met at the school Monday evening, Nov. 7th, for the purpose of taking some action toward the formation of an alumni association. The benefits that both the school and the graduates would derive from such an association were set forth briefly by the president of the school, Wm. E. Hatch, and by the superintendent, H. W. Nichols. All the graduates present spoke in favor of such an association and it was decided to appoint a committee to draft a constitution and by-laws. The chairman appointed as a committee Andrew W. Macy, asst. supt. of the Soule Mill; J. J. W. Cooper, asst. supt. of the New Bedford Cotton Mills, and H. W. Nichols, supt. of the New Bedford Textile School. It was voted that this committee report at an adjourned meeting to be held at the school Monday evening, Nov. 28th.

At the adjourned meeting, held Nov. 7th, the constitution and by-laws drafted by the committee were presented and adopted and the following officers were elected: President, Theodore Wood; vice-president, J. J. W. Cooper; secretary and treasurer, Lester D. Pratt; executive committee; the officers, Raymond Chase and Paul Gay. The annual meeting will be held in June following the graduation, at which time a banquet will be held.

The Tide Has Turned.

This is the striking title of the October issue of "Cotton Chats" by the Draper Company of Hopedale, Mass. It is followed by a long list of orders for Norfolk looms received in the past eleven weeks, totaling 6,673. About five-sixths of these are for the replacement of old looms and nearly all of them are repeat orders from old customers. They include looms for weaving wide and narrow sheetings, drills, denims, tickings, chambrays, seamless bags, pillow tubings, corduroys, ginghams, jeans, light ducks, fancy goods, etc.

This is a good indication that many of the level headed manufacturers are planning now for the improvement in business which will come later. In conversation with other cotton machine builders we have met a number who report their shops well occupied with orders and a few which are running overtime.

New Works Completed.

The Cooper Hewitt Electric Company, formerly having their headquarters at 220 West 29th St., New York, announce that the equipment of their new works is completed, and that the general offices have been removed to 8th and Grand Sts., Hoboken, N. J.

Southern Filter Agency.

H. G. Mayer, Realty Bldg., Charlotte, N. C., has secured the agency from Hungerford & Terry, Inc., Pennsylvania Bldg., Philadelphia, for the sale of their filters and water softening apparatus in the southern states.

The Moore Light Co., of Newark, N. J., manufacturers of the Moore yellow and daylight white vacuum tube lights, has opened a demonstration and sales office in New York at 500 Fifth Ave. The feature on which they lay special stress is the reproduction of light similar to daylight, showing colors accurately in their true values.

Testing Devices.

A new descriptive circular has been issued by Alfred Suter, 487 Broadway, New York City, general agent in the United States and Canada for Henry Baer & Co. of Switzerland, describing the automatic strength and elasticity measurer used in testing yarns, cloth, twines, skeins, etc. It employs no springs, is automatic, indicates both the strength and elasticity, it has a specially designed clutch which tightens the grip as more strain is applied.

Among other machines built by the same concern, for which Mr. Suter is agent, are scales and balances for yarn and roving, yarn beams to determine the size of yarn, yarn examining machines, twist counters, reels, conditioning ovens, spindle speed measurers, etc.

The New Plant of the Niagara Alkali Co.

The new plant of the Niagara Alkali Co., Niagara Falls, N. Y., which takes the place of the old Roberts Chemical Co., is nearly completed and will be in operation by January 1st. They are manufacturing caustic potash, caustic soda and chlorine gas, utilizing the Biliter Cell, as developed in Aschersleben, Germany, and Bruckl, Austria. This is of a simple horizontal diaphragm construction, operating by percolation, doing away with the necessity of having a circulating brine system. The cathode liquor comes off at a fairly high concentration, about 18 per cent., and no oil or other inflammable material is used in connection with the cell. The cost of the cell is low and the current efficiency operating commercially about 97 per cent.

From the chlorine gas they manufacture muriatic acid under the old Roberts patent owned by us, producing muriatic acid absolutely free from sulphur and arsenic. They also liquefy a portion of the chlorine gas, having in operation through their associates liquefying machinery for producing liquid chlorine in the United States. This branch of the business is handled by the Electro Bleaching Gas Co., 24 East 21st St., N. Y. City. They are also arranging to engage in the manufacture of tin chloride, carbon tetrachloride, potassium chlorate and bleaching powder. Another branch of the business will be the manufacture of acetylene tetrachloride, chlorides and oxychlorides of metaloids, zinc chloride, and this will be in charge of Dr. Geo. Ornstein of Niagara Falls, N. Y.

Their cell operates at 3,000 amperes and about 3 3/4 volts and the production per 24 hours equals 55 pounds of solid 90 per cent. KOH per cell.

They are in communication with a number of concerns who expect to install their cell for their own use and the next few years will doubtless see the Biliter cell in very common use among paper manufacturers, oil refiners, bleachers and soap makers.

A Beautiful Calendar.

The Grosser Knitting Machine Co., 260 West Broadway, New York, are sending out to the trade a beautiful calendar in colors entitled "The New Arrival." This calendar is unusually attractive both in sentiment and style, and is a typical and excellent example of the humbler phases and homelier aspects of Scottish life and character.

The Westinghouse Electric & Manufacturing Company, Pittsburg, has just received an order from the Charlton Mills, Fall River, Mass., for one 750 Kva., 600-volt, 3-phase, 60-cycle, 2-pole, 3600-r. p. m. turbo generator set. The low pressure turbine will be equipped with a No. 11 Westinghouse-LeBlanc turbine driven condenser. The generator fields, will be magnetized by means of a 50 Kw., 125-volt, D. C. turbo generator exciter set. The same order includes 300 Kva., 3-phase, 600-volt, 60-cycle, 514-r. p. m., A. C. 3-bearing, belted generator, one 25 Kw., 125-volt, 1150-r. p. m., 3-phase, 60-cycle A. C. motor generator set and one 4-panel switchboard.

Recent Textile Patents.

BOBBIN BORING Machine. 974,545. Luther C. Baldwin, Providence, R. I.

BRAIDING MACHINE. 973,637. Gustave Donat, Passaic, N. J.

CARDING MACHINE. 976,757. William Sullivan, Leicester, Mass.

CLOTH in the Desired Lengths. Device for Piling. 976,604. Samuel Sampson, Philadelphia, Pa.

CLOTH-TREATING Apparatus. 975,349. David Gessner, Worcester, Mass.

CLOTH-PILING Machine. 973,891. William M. Swerdlove, New York.

DYEING APPARATUS. Yarn. Jesse Midleton Payne, Phoenix, Ala.

DYEING. Packaging Yarn for. 974,127. Frederick H. Daniell, Franklin, N. H.

DYEING MACHINE. Collapsible Revolving Beam Vacuum for. 975,270. Frank M. Morton, Phoenix, Ala.

DYEING HALF Woolen Goods. 976,219. Georg Rudolph, Elberfeld, Germany.

DYEING MACHINE. Collapsible Revolving Beam Vacuum for. 975,269. Frank M. Morton, Phoenix, Ala.

DYEING MACHINE. 973,487. George E. Drum and James H. Skitt, Philadelphia, Pa.

FABRIC. 974,855. Paul L. Bousquet, Akron, O.

FABRIC. Apparatus for Treating Coated Textile. 976,231. Abraham Sydeman, Boston.

FABRIC-CHAIN Machine. 975,850. John F. Gail, Kenosha, Wis.

HOSIERY. 976,555. Loretto A. Costello, Philadelphia, Pa.

KNITTING MACHINE Attachment. Warp. 976,776. Thomas Branson, Philadelphia, Pa.

KNITTED WEB Hosiery and Making the Same. 974,302. Robert W. Scott, Leeds Point, N. J.

KNITTING MACHINE. 976,607. Robert W. Scott, Leeds Point, N. J.

KNITTING MACHINE Needle. 975,466 Robert W. Scott, Leeds Point, N. J.

LOOM SHUTTLE. 975,051. John La Palme Central Falls, R. I.

LOOM. Hand. 975,179. Martha P. and Dana Todd, Minneapolis, Minn.

LOOMS. Means for Facilitating Warp Change in. 976,273. Wm. McCaslin, Hopedale, Mass.

LACE FEEDING Device. 974,674. William H. Joslin and Manfred H. Bennett, Scituate, R. I.

LACE CUTTING Implement. 974,766. Dudley H. Gilges, Baldwin, Kans.

LOOM STOP Motion. 976,378. Charles D. Lanning, Boston, Mass.

LOOM BOBBIN. 976,120. Joseph P. Chatel, Manchester, N. H.

LOOM FORK-GRID Clearer. 973,741. Michael J. Armstead, Lowell, Mass.

LOOM PICKER Mechanism. 976,009. Dello Thibeault, Campello, Mass.

NEEDLING MACHINE. 976,033. Delmont S. Brown, Watertown, N. Y.

SPINNING and Twisting Device. Yarn. 9,751,-318. Victor Belanger, Sea View, Mass.

SPONGING APPARATUS for Tailors. 973,875. Bernard Paskowitz, New York.

SPINNING MACHINE. 974,030. Frederick S. Culver and Leon J. Morin, Taunton, Mass.

SPINNING PAPER Threads. Machine for. 974,132. Anton Funke, Westig, Germany.

SHUTTLE Attachment. Hand Threading. 976,-632. Napoleon Caron, Nashua, N. Y.

SPOOL. 976,381. Meredith Leitch, Springfield, Mass.

SHUTTLE. 974,291. Wilbur G. Peet, Bridgeport, Conn.

SHUTTLE TENSION Device. 974,309. Joseph E. Thayer, East Bridgewater, Mass.

SPOOL. JACK. 974,139. John C. Hebdenm, Providence, R. I.

SPOOL HOLDER. 973,861. Marie J. Eidam, Chicago, Ill.

SPINNING APPARATUS. Traverse Motion for Yarn. 974,614. Samuel R. Truesdale, Lonsdale, R. I.

SHUTTLE TENSION Device. 974,757. John L. Dow, Melrose Highlands, Mass.

SPOOL of Pasteboard, Cardboard, or Similar Material. 974,603. Albert Schmidt, Leipzig, Germany.

UNDERGARMENT. 974,787. Hannah Goolsby, Wauchula, Fla.

WARP STOP Motion for Looms. Charles D. Lanning, Boston, Mass.

WARP STOP Mechanism. James K. Lanning, Dorchester, Mass.

WINDING MACHINE. Cop. 976,698. Eppa H. Ryon, Worcester, Mass.

WOVEN FABRIC. 975,940. Charles L. Fetterly, Philadelphia, Pa.

Recent Textile Trademarks Registered.

"Millonario." Cotton piece goods. Otis Co., Ware, Mass.

"Raintex." Men's overalls made of woven cotton fabric. Oppenheim, Oberndorf & Co., Baltimore, Md.

"757." Dress shirts, negligee shirts and work shirts. E. Rosenfield & Co., Baltimore, Md.

"Securitas." Flannel shirts, jackets, drawers, dressing gowns, etc. Edouard Leurent, Tourcoing, France.

"Nestor." Woven belting. The American Fabric Belting Co., Cleveland, O.

"Windsort Cretonne." Plain white, dyed and printed cretonne. The Windsor Print Works, North Adams, Mass.

"Welcome." Cotton piece goods. Grinnell Willis & Co., New York.

"Storknest." Flannels in the piece. The Russel Embroidering Co., New York.